COMPUTERWORLD

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Rising to the occasion, the Decmate personal computer has been turned into an office workstation, Digital Equipment Corp. announced at Info '83 last week. DEC made the announcement with the help of magician Harry Blackstone, who added levity to the press conference as Henry Ancona, the product group manager of DEC's Office and Information Systems Groups, helped out.

Software Announcements Dominate Info '83 Debuts

By Paul Gillin
CW Staff

Coverage of Info '83 continues on Pages 19 through 36.

NEW YORK — Software announcements dominated the product introductions at the 10th International Information Management Exposition & Conference held here last week. Among them:

- Frey Associates, Inc. introduced an artificial intelligence query language for Digital Equipment Corp. VAX-11 superminicomputers that allows users to enter plain English commands for data retrieval, sorting, logical comparisons and calculations.

Called The Management Information System (Themis), the product is said to understand a basic vocabulary of more than 900 commonly used English words. Working from that base, users can "teach" the system to understand a virtually unlimited number of words, Frey claimed. Definitions may be cataloged at the user or system level, allowing different us-

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OA Steals Some Of Limelight

By Katherine Hafner
CW Staff

NEW YORK — Announcements of new office products stole some of the limelight from software products last week at the 10th International Information Management Exposition & Conference, with communications offerings few and far between.

Two local-area networks were announced, Northnet from General Binding Corp. and Wordlink from Wordplex Corp.

Northnet reportedly consists of a cable linking GBC System 9 desktop microcomputers, printers and disk drives. According to GBC, Northnet features "multidirectional" flow and independent station connections. A manager oversees network operations using a terminal called the "server station," allowing individual workstations to communicate with other stations on the network.

Each workstation on Northnet can

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Minis, Micros In Cameo Role

By Ed Scannell
CW Staff

NEW YORK — While software and office automation vendors made most of the product introductions at last week's 10th International Information Management Exposition & Conference, a handful of minicomputer and microcomputer vendors also brought out systems here.

Among the larger system introductions was Nixdorf Computer Corp.'s Model 10, which extends the company's 8890 Information System family downward. The company said the Model 10 was developed for decentralized applications and can be

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Inside

Comdisco, Inc. vigorously objected to a report in *Barron's* last week that suggested the computer leasing giant is facing disaster. **Page 5.**

• • •

More resumes enhanced by "artful lying" are crossing DP managers' desks, they told *Computerworld*. **Page 6.**

• • •

The civil lawsuit accusing Hitachi Ltd. of stealing IBM trade secrets ended in a settlement that gives the U.S. vendor extraordinary powers to monitor the Japanese vendor's future product developments. **Page 7.**

• • •

Democrats in the U.S. House of Representatives have pulled the plug on a controversial immigration bill. **Page 11.**

• • •

The first fruits of the IBM-Rolm Corp. joint development agreements have made their appearance. **Page 73.**

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A Canadian vendor crossed the Rainbow Bridge into the U.S. with a distributed system based on a local-area network. **Page 95.**

• • •

If you go to Las Vegas next month for Comdex, keep your eyes open for a personal computer that features a built-in local network and is compatible with the IBM micro. **Page 105.**

Tymshare Dons Gloves, Enters DEC's Arena

By Tom Henkel
CW Staff

CUPERTINO, Calif. — Tymshare, Inc. has made its debut as a vendor of stand-alone systems with the announcement of a 36-bit processor and operating system that is application-compatible with Digital Equipment Corp. Decsystem mainframes running under the Tops-20 operating system.

The value-added communications reseller claims to have set its sights on the mainframe market that it said DEC gave away. DEC announced last May that it had scrapped a plan to develop a follow-up product to the Decsystem-10 and Decsystem-20 [CW, May 30].

Instead of developing a larger 36-bit machine, DEC suggested Decsystem users migrate to its VAX-11 line of 32-bit superminicomputers, a process that requires software conversion. According to Tymshare, the System 26KL it has introduced can run applications programs developed for Tops-20 without conversion.

The System 26KL, which will be demonstrated for the first time next

(Continued on Page 4)

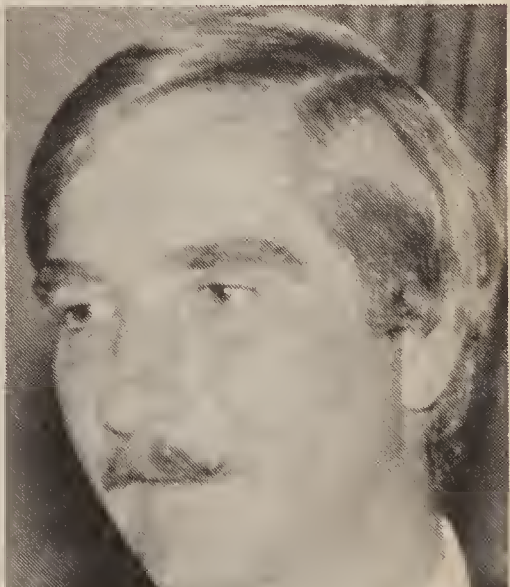
AT&T Deregulation Good For Users, Says Big Retailer

By Peter Bartolik
CW Staff

CHICAGO — Deregulation of AT&T "is a positive thing, at least from the standpoint of the user," according to the corporate telecommunications manager of the Montgomery Ward & Co. retail chain.

Speaking to the National Retail Merchants Association's 25th Annual Retail Systems, Technology and Communications Conference, Fred W. Livingstone related how he has used the deregulation situation to reorganize voice and data communications in the sixth largest U.S. retail organization.

The session Livingstone addressed was titled "Minimizing the Effects of Deregulation," but he said the subject should be maximizing deregulation. "Generally speaking, deregulation is going to increase the competitive environment in telecommunications," he said. It will also "bring out of [Bell Laboratories] the technology we've all been waiting for."



CW Photo by P. Bartolik

The deregulation of AT&T "will allow me to come out from underneath lease agreements that are too long," Montgomery Ward's Fred W. Livingstone told the NRMA.

The current situation also presents an opportunity to "alter company

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Wang's PIC: Major Commitment To Image Processing Technology

By Jim Bartimo
CW Staff

A new buzzword has begun making its way into the office: image processing.

Once confined to OEMs with a technology in search of an application, image processing is the digitization of printed words and pictures. The technology gained new respectability this month when Wang Laboratories, Inc. announced its Professional Image Computer (PIC) as part of its Professional Computer line, putting those digitized images on the screen and ultimately on a network for transmission and manipulation [CW, Oct. 10].

Wang's announcement was the first major commitment by an office vendor to this technology, although smaller vendors have released similar products without the networking capability.

Like most new technologies, image processing is only in the development stages and probably is not yet ideal for most users, according to office automation experts contacted by *Computerworld* after the Wang announcement. Problems faced by the PIC include the large amount of memory it requires, a lack of applications and the absence of any optical character recognition (OCR) capability.

"This particular product is interesting, but the people who need it won't find it cost-effective because of the storage," said Thomas Billadeau, president of The Office Systems Consulting Group, Inc. in Cambridge, Mass. "You must remember that Wang is putting voice on magnetic media. With voice, data and image, you'd have to change Winchester disks every 10 minutes."

One possible and probably inevitable addition to image processing will be another developing technology — optical storage disks. Since image processing requires so much disk space on which to store images, the capability to store billions of bytes that is offered by optical media will come in handy.

But "it's going to be an awfully long time before optical disks are available across the Wang product line," Billadeau said. "Some of the people at the PIC announcement thought that magnetic media costs were coming down enough to make it affordable, and that's just not true."

So who needs image processing?

One vertical market that has been clearly identified by Wang is the insurance industry. This sector, Billadeau observed, has a need to copy signatures and send copies of insurance policies to customers.

However, the director of research at International Data Corp. in Framingham, Mass., pointed out another reason: "We grow up thinking that books have words and pictures, and we feel very adult when we read our first book without pictures," said Thomas Elliott. "In business, we get more childish and we want more pictures again. The PIC is just a way to integrate pictures with data.

"You have to think of these products as part of the facsimile market," Elliott continued. "I think the PIC is aimed at the same person who was going to use the [Xerox Corp. advanced micro workstation] Star — the knowledge worker."

According to the head of the Boston Society of Wang Users, the PIC is too expensive and requires too much memory space on disk. "We have 151 Wang workstations, so I'd be hard pressed to get another one," said T. Allan Trick, who is word processing coordinator for The Christian Science Center in Boston.

"The announcement that was more important was WP Plus. It was really the first major upgrade to [Wang's] word processing since they started," Trick said.

Trick also said that the PIC would be more useful if the words within the movable blocks of text could also be manipulated. In its current form, blocks of text and pictures or graphics can be moved, but the text cannot be edited as it can with an OCR system that digitizes each character separately.

One consultant who agreed with that observation was John J. Xenakis, whose Framingham, Mass., company bears his name. "I think PIC's real usefulness lies in an OCR capability," Xenakis said. "I'm kind of surprised they didn't include it now because the technology makes it doable. Once they can do that, they'll really have something."

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Amdahl Center to Test IBM, Compatible CPUs

By Jeffry Beeler
CW West Coast Bureau

SUNNYVALE, Calif. — Amdahl Corp. last week formally marked the opening of a specialized data center that will reportedly allow IBM and IBM-compatible processors to be evaluated and compared in realistic production settings.

The opening was highlighted by the release of the data center's first two benchmark reports, both of which contain the latest relative performance ratings for the Amdahl 5860 and the IBM 3081 Model Group K mainframe.

One of the reports describes how the operation of the two machines compares in a TSO environment running under MVS/SP 1.3.0. The other document covers the results of a similar benchmark test conducted in an IMS/VS 1.2 environment.

In the TSO study, the 5860 was found to support an 18% to 20% greater work load than its IBM counterpart. In the MVS/IMS test, the Amdahl product was credited with processing approximately 3% more transactions than the 3081K, according to Thomas McKenna, Amdahl's director of product marketing.

Together, the two recently completed benchmark test results contradict the widely held view that the IBM processor outperforms its Amdahl equivalent, McKenna said.

Comparisons at Ampec

Both comparisons of the 3081K and the 5860 took place in the recently established Amdahl Performance and Evaluation Center (Ampec), which the company described as an extension of its existing benchmarking facility. Equipped with four CPUs, 80 spindles of disk storage and assorted IBM-compatible software products, Ampec can reportedly simulate a wide variety of typical Amdahl processing environments with great precision. The purpose of the simulation is to allow the company to measure accurately the performance of identically configured IBM and Amdahl mainframes and then compare the results.

Thus far, the center's efforts at performance evaluation and comparison have been limited to just two systems — the 5860 and the 3081K — and two software environments, MVS/TSO and MVS/IMS. But in the near future, Amdahl plans to broaden the scope of Ampec's testing activities to cover products like the IBM 3081J, 3380, 3725 and their Amdahl counterparts.

The company also plans to widen its performance evaluations and comparisons to embrace additional software environments, including VM/CMS, MVS/CICS and MVS/XA, McKenna said. Results of the VM/CMS, MVS/CICS and MVS/XA tests are expected to be released during the fourth quarter of this year, the first quarter of next year and the second quarter, respectively.

Amdahl regards its product testing center as a significant advance over traditional benchmarking procedures, which typically use the concept of execution speed as their main measure of processor power. By running rival products side by side in simulated production environments, Ampec will dispel much of the fog that has surrounded past CPU evaluations and will greatly increase the precision of the resulting performance comparisons, McKenna said.

First Two Studies

In Ampec's first two product evaluation studies, Amdahl compared the performance of a 16M-byte, 16-channel 5860 with a similarly configured 3081K. The first test took place in an IMS/VS environment featuring 14 direct-access storage device (Dasd) channels and 65 Dasd spindles; the second took place in a TSO setting with the same number of channels and 70 spindles.

In the IMS study, the number of terminals remained constant while the 5860 and 3081K processed an identical work load ranging from 10.2 to 34.1 transaction/sec. At up to 25 transaction/sec, the two machines provided almost exactly the same CPU response times.

But as the work load increased beyond the 25 transaction/sec mark, the performance difference between the 5860 and the 3081K steadily widened, with the Amdahl mainframe holding the edge. Neither processor was able to accommodate more than 35 IMS transaction/sec.

In the TSO test, Amdahl arrived at its relative performance ratings by gradually increasing the number of concurrent users on the two machines until their average CPU response times exceeded one second. By the time it passed the company's response-time limit, the 5860 was supporting 300 simultaneous users, compared with 250 for the 3081K.

Honeywell Touts DP/Process Control Unit, But Admits DP Integration Not Yet Ready

By Tom Henkel
CW Staff

PHOENIX — Claiming to have laid the groundwork for a computer system capable of integrating plant floor information with the data stored in a company's mainframes, Honeywell, Inc. last week unveiled the TDC 3000.

In its current state, the TDC 3000 is basically a process control system, admitted James Verrant, vice-president and general manager of Honeywell's Process Management Systems Division. But he noted that the TDC 3000 includes the Local Control Network, a local-area network that can be used to integrate process control information with other, previously separate plant functions, such as production scheduling, inventory control maintenance and administration.

All that is necessary to link the TDC 3000 with systems performing DP functions is a series of applications programs that allow the user to extract TDC 3000 information and put it into a useful form. While Verrant admitted that developing the applications is not a trivial task, he said Honeywell is already working with two beta users of the TDC 3000 system to develop the software.

Verrant would not say when the TDC 3000 could be linked to DP systems.

The TDC 3000 consists of various controllers that monitor and control processes. Data from the controllers is standardized and transmitted through the Local Control Network to storage modules. The storage modules, which consist of banks of Winchester disk drives, can be accessed by various devices, including Honeywell DPS 6 and DPS 8 processors using Honeywell's Distributed Systems Architecture or IBM's Systems Network Architecture, Verrant said.

The TDC 3000 has an extremely broad purchase price ranging from $100,000 to $10 million. Verrant said, however, that a typical system will cost between $200,000 and $500,000.

The first TDC 3000 systems will be available in the fourth quarter, Honeywell said. Honeywell's Process Management Systems Division is located at 16404 N. Black Canyon Highway, Phoenix, Ariz. 85023.

Tymshare Offers DEC-Compatible CPU

(Continued from Page 1)

week at the Dexpo/West conference in Las Vegas, is available with 512K to 8M 36-bit words of main memory (about 2M to 20M bits) and claims a processing speed of approximately 1.9 million instructions per second. The system occupies about 20% of the space of DEC's top-of-the-line Decsystem-2060 processor and, according to John F. Swarbrick, Tymshare's vice-president of computer systems and support, consumes a fraction of the power required to operate the 2060.

The System 26KL uses the Tymcom 20 operating system, which Swarbrick said is compatible with Tops-20. In addition, the system is microprogrammable, which allows customers to develop special microcode. This, Swarbrick said, can reduce the runtime for customized applications.

By adding an interface board, the System 26KL can communicate through a variety of public and private networks, including Tymshare's Tymnet, networks compatible with Xerox Corp.'s Ethernet and the U.S. Department of Defense's Arpanet/Milnet.

The System 26KL is roughly equivalent in performance to the Decsystem-2050. It offers approximately 1.4 times the performance of the smaller Decsystem-2040 processor and operates at about 80% the speed of the 2060, according to Swarbrick.

Tymshare is working on a larger version of the 26KL, which reportedly will offer greater performance than the Decsystem-2060, Swarbrick said, estimating that the processor will probably be available in one or two years.

Marketing to Tops-20 Users

The 26KL central processor was developed using transistor-to-transistor logic circuitry and is manufactured by Foonly, Inc., a Mountainview, Calif., OEM. The rest of the system will be integrated by Tymshare using specialized components, according to Robert Liberman, Tymshare's department manager for operating systems.

Tymshare will market the 26KL to approximately 2,000 users of the Tops-20 operating system. The 26KL can be used as a second processor for users running out of space on their existing systems, Swarbrick said.

Tymshare's nationwide hardware maintenance service for DEC and DEC-compatible systems will handle maintenance on the system, which ranges in price from $275,000 to $350,000, depending on configuration.

Tymshare is located at 20705 Valley Green Drive, Cupertino, Calif. 95014.

IPL Delays Shipments Of Dual-Processor 4480

WALTHAM, Mass. — IPL Systems, Inc. has delayed first shipments of its dual-processor 4480 system for several months to give the firm time to iron out unspecified problems with the system.

IPL announced the 4480 last February [CW, Feb. 14] as a parallel processing system that would be compatible with IBM's 370-era systems software. The systems were originally slated to begin shipping in September, but an IPL spokesman cited a conglomeration of what he termed "minor" problems as the reason the firm delayed first shipments.

First 4480 shipments are now scheduled to begin sometime before the end of the year, the spokesman said, but he did not elaborate.

Word of the shipment delay came along with an announcement from IPL that the firm expects to post a $1.1 million loss for the third quarter ending Oct. 1. IPL attributed the loss to market uncertainty stemming from anticipation of IBM's announcement of a high-end addition to its 4300 line of processors.

Lessor's Accounting Practices Questioned

Comdisco Rebuts Report Suggesting Trouble

By Bill Laberis
CW Staff

CHICAGO — A published report implying that the accounting practices of computer leasing giant Comdisco, Inc. could result in overstated earnings has provoked strong rebuttals from the leasing industry while rattling the skeleton of the OPM Leasing Services, Inc. scandal.

The report appeared last week in *Barron's* financial weekly and suggested that internal and external forces are mixing to create a potential disaster scenario for Comdisco as well as other third-party lessors. Meanwhile, the report stated, company officers, including founder and Chairman Kenneth Pontikes, have gone on a Comdisco stock-selling spree in the past two years, getting rich in the process.

After publication of the report, Comdisco's stock lost nearly 37% of its paper value in one frenzied day of trading last Monday, falling from $38 to $24 per share.

To allay fears of stockholders and users, Comdisco issued a lengthy memorandum last Wednesday claiming its accounting practices are within the purview of federal rules and regulations. The memorandum stated further that Comdisco, presently the No. 1 computer lessor, is well positioned for future growth in the leasing field, despite the aggressive posturing of IBM's leasing subsidiary, the IBM Credit Corp.

"Basically, the *Barron's* article was extremely misleading, a malicious attack based on half-truths and information taken entirely out of context," Pontikes said in a telephone interview last week. "We're a publicly held company audited by one of the Big Eight [Peat, Marwick, Mitchell & Co.]; how could our books be out of order the way [*Barron's*] suggests they might?"

According to *Barron's*, a portion of Comdisco's earnings includes the anticipated residual value (the market value of a system when it comes off lease) of some leased equipment. Assuming a worst case scenario, the report stated that if all Comdisco's leased equipment had a zero residual value, the company's net worth "would vanish."

Thus, because residual values cannot be predicted exactly, Comdisco could be reporting earnings it will never see. Those earnings totaled nearly $30 million in 1982 and have been growing at a 100% clip for the past few years.

In its shareholder memorandum, Comdisco claimed that the amount of residual value it has carried on its balance sheet has historically been about half the actual market value of equipment coming off term lease. In other words, the memo indicates that Comdisco, if anything, has understated earnings.

Ghost of OPM?

But just the suggestion of questionable accounting practices drew a shudder from the Computer Dealers and Lessors Association (CDLA), whose members have fought to regain respectability for their industry following the OPM leasing scandal, a $500 million swindle that landed its founders in jail.

"With loose implication, *Barron's* tried to draw vague comparisons with OPM, I suppose," said James Benton, executive director of the CDLA. "OPM was out-and-out fraud. The way Comdisco handles its books, and the other lessors, is all 100% aboveboard, and they've got the external auditors to back them up."

Benton said that the so-called wraparound, tax-leveraged leases common today have "saved users and investors millions of dollars."

Benton's sentiments were echoed by Richard Forsythe, president of the CDLA and chairman of Forsythe/McArthur Associates, and other CDLA members interviewed last week. Forsythe said many of the larger lessors carry residual values on their balance sheets — all within federal guidelines. He said further that there is no similarity between generally accepted accounting practices in the leasing industry and the OPM scandal, "although I'm afraid some people might make that connection because of the hatchet job done by *Barron's*."

The *Barron's* report further stated that IBM Credit Corp. will dethrone Comdisco as the leading computer lessor and will force Comdisco to take dangerous financial risks to stay afloat. While many analysts agree that IBM Credit Corp. will become the biggest lessor, they also state that there will be plenty of business left for the third-party lessors.

"IBM Credit Corp. has grown by leaps and bounds in the last year, but a lot of that growth came from the parent company — which is phasing itself out of leasing — not out of the pockets of the CDLA people," said Charles Greco, who tracks residual values and the leasing business for International Data Corp. in Framingham, Mass. "The Credit Corp.'s share of the market is growing, but the third-party guys are doing better, too."

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YOURDON

DP Managers Say False Resumes Common

By John Gallant
And Lynn Haber
CW Staff

At first glance, the resume looks too good to be true.

The candidate attended the best schools, worked for reputable firms and has exactly the background and experience you are looking for. But something sounds a warning bell in your mind. A little digging and you discover that the candidate for that all-important position in your DP organization has "artfully lied" on his resume — overstated or exaggerated his education, qualifications or his experience.

If you are fortunate, you'll find this out before you make him an offer. If not, the mistake may cost your company more than just his salary.

If you are familiar with this scenario, you are not alone. Two-thirds of the 21 top-level DP executives contacted recently by *Computerworld* in an informal telephone survey said they had encountered artful lying by job candidates. Surprisingly, however, less than one-quarter of those executives felt that resume embellishment posed a major problem.

Only two of the DP executives queried had encountered applicants who lied outright on their resumes. More often, candidates had puffed up their qualifications or income to put themselves in line for higher paying positions. Eager to move up the ladder in a DP organization, or hoping for the chance to work with an advanced system, they stretch the truth, claiming to have "headed" project teams or "designed" new hardware or software.

"The problem is that we advertise artificially in this field. The criterion for a good employee is fast learning. But we advertise for people with years of experience with specific hardware or software. People who want a chance to work with the system are willing to fudge on their resumes to get inside. We haven't encountered much outright lying, but expansion, that's another thing," said Frank Schlier, director of information systems for the Washington, D.C.-based American Bankers Association (ABA).

"Anyone who doesn't overstate [his] income, now that's unusual," said Robert C. Maughan, executive director of information services for Arthur Young and Co. in New York City. "According to most resumes, they've encountered every operating system, every programming language and everything else. In my opinion, when they say they've worked on [an IBM] 4341 system, it means they bumped into it one day and now they're experts."

Stephen Asakawa, vice-president of computer center administration for City National Bank in Los Angeles, agreed. "Mostly, it's a gross exaggeration of experience. I'll give you a typical example. I received a resume that listed four years of CICS application experience. The candidate had used CICS applications, but he didn't know the first thing about coding in CICS. Maybe the candidate read a manual, and now he claims expertise in that area."

According to DP executives, the problem stems both from intense competition for top management information system positions and from the use of loosely defined terms tossed casually about in the industry.

"Resumes often state qualifications that are interpretations of certain words," observed R.L. Pitcher, director of information systems for Cambridge, Mass.-based Arthur D. Little, Inc.

Worsening Situation

While only five of the executives said artful lying on resumes poses a major problem for their firms, nine claimed the situation is getting worse. City National Bank's Asakawa said, "I have seen more of it lately. But that may be because I look more closely for it now."

John Smart, vice-president for data processing services for Sysco Corp. in Houston, "would have to say that it is increasing, especially on resumes prepared by individuals. People tend to get frustrated when they find they aren't as smart as they think they are."

And Schlier added,"I think it's going to get worse as long as we continue writing employment ads for specific equipment and software. We're asking for things that aren't relevant to the job. As a result, people who've leaned up against the machine are going to say they have experience with it."

According to Guy Edwards, vice-president of information services for Philadelphia-based Provident Mutual Life Insurance Co., the situation will worsen. "As it becomes more of a buyer's market, applicants will tend to stretch the truth more. If you hire through blind resumes, you're going to face 50% of the candidates overstating."

Four of the DP chiefs blamed much of the problem on employment agencies who fail to verify resumes. George Gautney, vice-president of computer services at Amtrak's Washington, D.C., headquarters, said, "The potential for an increased problem is there, especially with consultants and contractors who escalate the qualifications of individuals. I won't call it lying, but it is certainly stretching the truth."

Michael Long, group vice-president for information systems for Fidelity Union Life Insurance Co. in Dallas, went further. Recruitment agencies, he said, "don't screen individuals to see what level of expertise they've really achieved. It probably causes us to do more interviewing than we'd like. We have to do more interviews to find out what's really there."

"Agencies are trying to move a lot of people fast," Arthur D. Little's Pitcher added. "They're letting people with three or four years' experience think they're qualified to demand a higher position or to use a bigger title."

In contrast, one company now relies almost totally on personnel agencies to avoid resume embellishment. Sysco's Smart said, "We are cognizant of this problem, so we've confined ourselves to using two reputable national recruiters who do screening for us."

One-third of the respondents to *Computerworld's* survey claimed to have circumvented the problem through training programs or by promoting from within, both of which decrease reliance on outside hiring. "We have dropped into hiring most people through a work-study program at a university here," Edwards said. "We know who we're working with. I've found that this produces a 100% correlation between what we thought we were hiring and what we got."

George DiNardo, senior vice-president for information management and research for Mellon Bank in Pittsburgh, Pa., said, "The rest of the world may have that problem, but we don't. Checking the veracity of resumes is a waste of my time, so I get my employees right out of college. I don't hire retreads, and I don't hire other people's problems."

"We generally hire our own people," Arthur Young and Co.'s Maughan said. "We've been very unsuccessful with going out and hiring people. You try to hire for one position, and you have to interview a slew of people. The chances are that to get the person you want, you have to go through two or three hirings."

A majority of the DP executives contacted employ an intensive interviewing process, involving both management and technical people, in order to screen prospective employees.

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Supreme Court Nixes Review

WASHINGTON, D.C. — The U.S. Supreme Court last week refused to review lower court rulings that found AT&T guilty of violating the Sherman Antitrust Act. But the plaintiff in the case, MCI Communications Corp., also lost its bid to prevent reconsideration of a record $1.8 billion fine levied on the telephone company.

Three years ago, a federal district court in Chicago found against AT&T for 10 of 15 antitrust violations charged by MCI. The specialized carrier, AT&T's most aggressive competitor, was awarded $1.8 billion in damages.

Last year, on appeal, two of the 10 violations were erased, including the charge that the phone company had engaged in predatory pricing. Because a significant part of the penalty rested on this charge, the appeals court sent the whole question of damages back to the district court for a new trial. MCI and AT&T then appealed to the Supreme Court.

John Worthington, MCI's senior vice-president, said last week that he expects the district court retrial to begin next spring. Pointing out that business has been "a hell of a lot better than we thought it would be" since the original fine was announced three years ago, Worthington indicated that MCI will ask for higher damages.

IBM, Hitachi Settle Civil Suit Out of Court

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A year-old civil lawsuit accusing Hitachi Ltd. of stealing IBM trade secrets has ended in an out-of-court settlement that gives the U.S. vendor extraordinary powers to monitor its Japanese competitor's future product developments.

Under the settlement, IBM has gained the right to scrutinize any new Hitachi systems product whose first customer shipment occurs between now and Oct. 1, 1988. The main aim of the proposed inspections is to prevent Hitachi from using the IBM technology it acquired as a result of a 1982 trade-secrets theft scheme, according to an IBM press spokesman.

The settlement also calls for the creation of a three-member arbitration board that will referee the product inspections and resolve potential quarrels. If, for example, the two companies disagree about whether a future Hitachi offering incorporates stolen IBM trade secrets, the dispute will be referred to the committee within 30 days.

Another 30 days will then be available to the arbitration panel to settle the argument and make its ruling known. Both vendors are required to treat the committee's decisions as final, according to legal papers that IBM and Hitachi filed jointly in U.S. District Court Oct. 6.

Participating on the board will be John Bertram, president of IBM's General Products Division in nearby San Jose, Calif., and Takeo Miura, board director and group executive of Hitachi's Computer Group. The panel will also include a chairman, whose selection requires both companies' approval. The chairman will be named no later than Nov. 4, the court papers said.

Other provisions of the Oct. 6 settlement require Hitachi to pay all of IBM's civil suit legal fees and to return any trade secrets it has already stolen from the industry giant or may acquire in the future.

In addition to permitting IBM to examine every new Hitachi systems module during the coming five years, the settlement calls on the Japanese firm to surrender all of its accompanying documentation, including product specifications and user manuals.

Submitted before U.S. District Court Judge Spencer Williams, the settlement finally ends Hitachi's involvement in a trade-secrets theft case that first burst on the scene more than 15 months ago. The case resulted last year in criminal indictments against Hitachi, Mitsubishi Electric Corp. and more than 20 of their employees or agents, all of whom were accused of conspiring to transport stolen IBM trade secrets to Japan.

Among the targets of the alleged theft attempt were documents describing 370 Extended Architecture, workbooks detailing the 3080 series' hardware design and source code for MVS/SP Version 2.

On Sept. 16, 1982, IBM compounded Hitachi's legal predicament by naming the Japanese vendor as a defendant in a civil suit that mirrored the criminal charges already facing the firm. Also named in the suit were Hitachi's U.S. business partner, National Advanced Systems, Inc. (NAS), and its parent company, National Semiconductor Corp. The civil litigation against National Semiconductor and NAS, a supplier of Hitachi-manufactured IBM-compatible processors, is unaffected by the Oct. 6 settlement, the IBM spokesman noted.

Among other things, the Sept. 16 legal action called on Hitachi to return stolen IBM trade secrets and sought to prevent the Tokyo-based company from using the technology in its future products.

Last February, Hitachi pleaded guilty to the criminal charges facing it and received the maximum penalty of a $10,000 fine. But although the guilty plea ended the criminal phase of Hitachi's legal troubles, the civil suit persisted, with both sides initially holding out little hope for an out-of-court settlement.

After several months of additional negotiation, however, the IBM vs. Hitachi civil action was finally settled Oct. 6. Among its other repercussions, the agreement is expected to result in the dismissal of a countersuit that Hitachi filed against IBM July 1 in Tokyo. The Japanese litigation in effect constituted a refusal by Hitachi to return and to forego use of the technology the firm had already pleaded guilty to stealing from IBM.

Ansi X3 Committee Seeks Members

WASHINGTON, D.C. — The American National Standards Institute (Ansi) X3 Standards Planning and Requirements Committee Data Base Study Systems Study Group is seeking additional members to help plan and develop a family of standards for data base systems.

The project includes investigating and coordinating projects using an architectural framework for data base standards.

Those interested in joining the committee can contact committee chairman John W. Young Jr. at NCR Corp., 9900 Old Grove Road, San Diego, Calif. 92131.

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Software Dominates Info Debuts

(Continued from Page 1)

ers to maintain a library of personal definitions.

The product requires either VAX-11 Datatrieve or Oracle Corp.'s Oracle data base management system. It costs $24,500 from Frey at Chestnut Hill Road, Amherst, N.H. 03031.

University Computing Co. (UCC) released a Report Processing and Tracking (RPT) component for its UCC-7 Automated Production Control System for IBM MVS operating systems. The new subsystem provides the facilities for a data center to manage batch production output information, UCC said.

On-line facilities provide both inquiry and update capabilities to the report distribution data. A report archival function negates the need to rerun a job to recreate a lost report.

The introductory price of the subsystem is $9,500 from UCC at UCC Tower, Exchange Park, Dallas, Texas 75235.

NCR Corp. announced a link which allows users of its Decision Mate V microcomputer to transfer and receive data from either NCR's advanced 9300 system or its medium- to large-scale V-series mainframes.

A File Extract Facility (FEF) utility permits selection and extraction of data elements or fields from the data base for output to a sequential data file. The file can be sent via the File Transport Facility (FTF) to an NCR personal computer.

The FEF and FTF are each expected to sell for $1,000/mainframe, although NCR stressed that final pricing has not yet been determined. More information is available from NCR, Dayton, Ohio 45479.

Applied Data Research, Inc. (ADR) introduced software for generating computer-based training materials that integrates videotape/disk technology with IBM Personal Computers. ADR/Adroit (ADR Online Interactive Training) allows users to simulate software applications normally run on IBM 3270 terminals and incorporates high-resolution graphics and video programs.

Courses can be created with a text and graphics editor, and videotape materials can be incorporated into the course, activated by the Personal Computer. The system is priced at $3,000 to $4,000 per Personal Computer and requires 128K bytes of memory. Interactive video requires the use of a red, green and blue video monitor. ADR is located at CN-8, Rt. 206 and Orchard Road, Princeton, N.J. 08540.

Interactive Images, Inc. (III) and ADR also announced an agreement to develop jointly and market ADR and III products to support touch-screen workstations designed around III's Easel software. Easel allows users to create and manipulate application programs by touching visual color images on a touch-sensitive screen. ADR and III will develop Easel software extensions to ADR/Dataquery, ADR/Empire and ADR/email.

III also announced that Easel will be available on the IBM Personal Computer XT. A typical configuration includes a 14-in. color monitor with touch-sensitive screen, graphics display controller, co-processor with 512K bytes of random-access memory, serial communications port and Easel software. The price ranges from $2,000 to $6,000, depending on configuration. III is located at 21 Olympia Ave., Woburn, Mass. 01801.

A set of integrated information center software for DEC VAX-11 and Data General Corp. Eclipse computers was announced by Creative Consulting Corp. International (3CI). Called Infocen, the package combines a relational data base management system, forms, color graphics, statistics, reports, electronic messages and user-definable commands.

The Relational-Plus data base management system combines hashing techniques and relational storage technology. The query processor is self-tutorial at all levels. User-definable command tables make it possible to redefine permanently or temporarily command verbs and data set names.

Prices range from $29,500 to $59,500, depending on options selected from 3CI, which is based at Solar Office Plaza, 155 W. Harvard, Fort Collins, Colo. 80525.

Goal Systems International, Inc. announced Vsamaid/XP, a Vsam tuning facility intended to address problems of poor performance, poor direct-access storage device space utilization and limited management facilities. The product reduces wasted disk space through the use of mathematical algorithms. A modeling facility helps to determine optimum virtual storage allocation.

The permanent license price for IBM OS/VS users is $5,040. The price for DOS/VSE users is $3,080. Goal is home-based at 5455 N. High St., Columbus, Ohio 43214.

A micro-mainframe communications software package that boasts faster communications start-up was announced by Comshare, Inc. Microseek provides users of the IBM Personal Computer and Personal Computer XT asynchronous communications capability with mainframe hosts.

The product includes file transfer with optional error detection and correction, terminal emulation, a library of files for automatic connection to mainframe hosts and the ability to automate repetitive Personal Computer/host tasks, a spokesman said.

The product requires 96K bytes of memory and one disk drive with an RS-232 interface and asynchronous communications board and modem. It costs $200 per copy.

Microseek-Plus, including the mainframe file transfer program for error checking and five copies of Microseek, costs $3,500 plus a $525 annual maintenance fee. Comshare is located at 3001 S. State St., Ann Arbor, Mich. 48106.

MCBA, Inc. announced that its line of packaged software applications will be available on a variety of microcomputers. The products include accounts payable, accounts receivable, base materials requirements planning, bill of material processor, customer order processing, fixed assets and depreciation, general ledger, inventory management, job costing, labor performance, mailing list, payroll, purchase order and receiving, shop floor control, standard product costing and standard product routing.

Prices range from $600 to $2,000, depending on operating system. MCBA is at 2441 Honolulu Ave., Montrose, Calif. 91020.

Phoenix Computer Corp. announced Release 6.2 of Falcon, an online data entry system for IBM MVS, VS/1, DOS/VSE and DOS/MVT (VSE) operating systems. The system now includes a conversion facility that enables the user to transfer formats automatically from IBM's Video/370 data entry system to Falcon.

Other new features include a range-checking feature, table maintenance facility and job-submit feature. Purchase price on DOS systems is $19,500 and on MVS systems is $24,500.

Phoenix also announced a printer support facility for its Condor online program development system for DOS, DOS/VSE, DOS/MVT(VSE) and Edos/VS operating systems. Through Printer Remote Interface Support Module (Prism), Condor users at IBM 3270-type terminals can retrieve output from operating system spooler queues and send it to IBM 3280-, 1403- or 3211-compatible local or remote printers.

Prism is available in a stand-alone version for $6,000 or as part of Condor, which costs $19,500. Phoenix is located at 11949 Jefferson Blvd., Culver City, Calif. 90230.

Info '83 Focuses on Business Plan

By Ed Scannell
CW Staff

NEW YORK — Keeping pace with the DP manager's elevated role in the corporate decision-making process, organizers of last week's 10th International Information Management Exposition & Conference (Info '83) here made "Tying the Information System Into the Business Plan" the theme of the four-day event.

In the days when computers were used primarily for accounting applications, the chief financial officer usually decided whether to buy computer equipment. But as computer applications have broadened, corporations began relying more on the DP or information systems manager to pick the system that would best accommodate their growing needs.

"Computers didn't tie in with the overall business plan in the past. But now you can't put a proper business plan together if you are not taking the information system into consideration," Leo Bowser said, show manager for Info '83.

The titles of many Info '83 sessions supported the show's theme — "Using Information Technology to Improve Strategic Business Management" and "Strategic Use of Information Systems in the Business," for example.

"A lot of other shows today, such as Comdex, are aimed at the systems integrator. But our goal here is to go after the people in charge of purchasing and using these systems, not the people designing them," Bowser said.

Despite some stormy weather and the fact that the show opened on Columbus Day, Info '83 drew slightly more than last year's 40,250 attendees. This year, 350 vendors exhibited and demonstrated their products and services, compared with 293 last year; besides U.S. vendors, companies from Japan, the UK, Canada and Israel displayed wares.

While the IBM, Digital Equipment Corp. and AT&T exhibits attracted the usual hordes, Wang Laboratories, Inc.'s Professional Image Computer, introduced two weeks ago, grabbed the attention of most show goers.

Office automation and software vendors dominated this year's show in terms of product introductions. Full details of those announcements begin on Page 1.

Xerox Covers Bets, Buys Osborne Parts

ROCHESTER, N.Y. — Calling it a hedge against "the possible demise" of Osborne Computer Co., Xerox Corp.'s Service Group here has bought up an undisclosed amount of Osborne parts and promised to provide repair work on the portable computers for anyone who holds an Osborne warranty.

Despite swirling rumors last week that Xerox planned to buy the cash-strapped San Francisco maker of portable computers, spokesmen for Xerox maintained that the company had no interest in bailing out Osborne. Xerox's interest, it said, is confined to continuing the service pact it entered into 18 months ago with Osborne.

Osborne filed for protection from its creditors under Chapter 11 of the Federal Bankruptcy Act last month. Under the agreement announced last week, Xerox promised to pick up Osborne's warranties on its Osborne/1 and Executive/1 computers, provided owners buy an additional one-year service contract from Xerox.

Osborne President Robert Jaunich said that the agreement is "important at this time because of the financial difficulties being experienced by Osborne. The assurance it provides of continuing service support should help to stabilize the market for Osborne personal computers and restore customer confidence."

However, a Xerox spokesman admitted that his company considered the agreement a "hedge against Osborne's possible demise." The spokesman also warned that non-Xerox customers should not expect to obtain Osborne parts from Xerox if Osborne should go out of business.

Mini, Micro Vendors Show New Units at Info

(Continued from Page 1)

used as a CPU in networks based on IBM's Systems Network Architecture.

Compatible with the other three members of the Information System family, the Model 10 simultaneously supports asynchronous, bisynchronous and IBM Systems Data Link Control protocols, a spokesman said. The processor can be field-upgraded to the level of higher end 8890 models and is supported by Nixdorf and IBM operating systems such as Nidos/VSE, DOS/VE, SSX/VSE and VM.

The Model 10 features integrated disk and tape drives and is equipped with communications adapters controlled by independent microprocessors. The system is available immediately for $37,000.

Nixdorf is home-based at 300 Third Ave., Waltham, Mass. 02154.

Supermini From Basic Four

Management Assistance, Inc.'s (MAI) Basic Four Information Systems Division unveiled a 32-bit business system that will be a part of the firm's 8000 series. The system is expected to compete in the commercial marketplace against the offerings of IBM, Digital Equipment Corp. and Hewlett-Packard Co.

The system comes in three different models priced between $50,000 and $500,000. The MAI 8010 contains a single processor while the 8020 and 8030 models contain two and three processors, respectively. The 8030 supports as many as 100 terminals at a cost of approximately $4,000 per workstation.

A typical 8030 configuration will cost $210,000, a spokesman said. Basic Four is located at 14101 Myford Road, Tustin, Calif. 92680.

Micro Introductions

While most microcomputer vendors have decided to wait for next month's Comdex show to introduce systems, several manufacturers announced both desktop and portable systems.

Philips Information Systems, Inc. unwrapped a 32-bit multiuser supermicrocomputer that is user-programmable and provides data base management capabilities at the workstation level, according to the company. The Information Processing System (IPS) is compatible with the Unix operating system and with Philips' series of workstations.

The IPS holds up to 4M bytes of internal storage and up to 500M bytes of disk storage; it supports as many as 30 of Philips' universal workstations. The system is available immediately from Philips at 4040 McEwen, Dallas, Texas 75234.

Xerox Portable

A surprise hardware announcement, made late in the show, was Xerox Corp.'s 5-lb portable microcomputer that fits into a briefcase. The Xerox 1810 is dual-processored, incorporating both 8- and 16-bit chips compatible with Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s operating systems.

The unit holds up to 64K bytes of storage, has an LCD screen and operates up to 10 hours on rechargeable nickel-cadmium batteries.

The cost of the unit is $2,195. Xerox can be reached at Xerox Sq. 006, Rochester, N.Y. 14644.

Rair Computer Corp. unveiled its Black Box 3/60S, a 16-bit microcomputer aimed primarily at OEMs and technical users. Based around Intel Corp.'s 8088 microprocessor, the 3/60S features 256K bytes of random-access memory and interfaces with up to 16 terminal, peripheral and data communications devices through an RS-232 serial port.

The desktop unit supports the Digital Research MP/M 86 multiuser operating system as well as a variety of 16-bit programming and applications software. List price of the basic system, which holds 1M byte of memory, is $9,750. Rair is at 4101 Burton Drive, Santa Clara, Calif. 95050.

Portable Systems

Both Computer Transceiver Systems, Inc. and Microoffice Systems Technology, Inc. took the wraps off portable systems. Computer Transceiver's portable entry is called the Execuport XL series and features both Intel's 16-bit 80186 processor and Zilog, Inc.'s 8-bit Z80 processor. The system runs under Microsoft's MS-DOS operating system.

The XL's basic configuration holds 128K bytes of memory, features a 9-in. by 5-in. green phosphor screen and dual 5¼-in. floppy disks that store 400K bytes of formatted data. Software options for the system include the MP/M operating system.

Priced at $3,295, the dual processor system is available now from Computer Transceiver, E. 66 Midland Ave., Paramus, N.J. 07652.

Microoffice's 100/Roadrunner will be sold to both the high-volume end-user and OEM markets. The notebook-size system's screen displays eight 80-char. lines and features removable cartridges.

Software packages available for the system include a text editor, spreadsheet, Basic language, appointments manager and terminal communications. The cost of the CP/M-compatible system is $1,895.

Microoffice is headquartered at 35 Kings Highway E., Fairfield, Conn. 06430.

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4 Reasons Why These Books Are Effective

1) These books were written by an expert from industry, Kevin McQuillen. He's been a DP manager, consultant, and manufacturer's rep, so his books are chock-full of solid, practical, real-world advice.

2) Kevin selected the content of these books based on an analysis of the tasks normally required of an applications programmer. That's why these books contain everything of use to the average programmer and very little that isn't. That's also why the books give substantial coverage to job-control language. The DOS book covers DOS and DOS/VS; the OS book covers MFT, MVT, VS1, and VS2.

3) The books are organized in the most effective way possible for a programming course. Quite simply, a complete subset of BAL is presented in the first three chapters of the book. After this, all material is organized by function (debugging, table handling, subroutine linkage, etc.). As a result, the student always sees the relationships of the parts.

4) Each book contains dozens of complete program listings. They start with card-to-printer programs and end with programs that create and retrieve direct files. In between there are listings for routines and programs that perform code translations and input validations, set up the linkage between mainline modules and subprograms, load and use tables in storage, create and retrieve sequential and ISAM files, and so on. In our experience, these listings, more than any other factor, determine whether or not a course is effective. And they are the missing ingredient in most assembler language courses.

'The manuals we purchased from you are the finest we have ever used. They have allowed our programmers (and not a few analysts, too) to write programs better and faster than I would have ever believed possible.'

General Manager
Santa Cruz, CA

How You Can Use These Books

When you receive these books, you will have several options for using them. If you don't really have a training program, you can simply pass the books on to your programmers. If they have the aptitude for BAL programming (as they probably do), this by itself should accomplish your training objective.

If you want more control than that, you can set up a progress schedule for each student and assign a senior programmer to be available for questions. To test mastery, you can assign problems from the book or actual production jobs. When a student writes and tests the required programs, you will be convinced of the effectiveness of our books.

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If you have an existing training program in assembler language, the quickest way to increase its effectiveness is to give our book to all students. Because our books contain dozens of complete program listings, they quickly improve coding techniques. Because they provide detailed procedures for testing and debugging, they quickly improve debugging efficiency.

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Office Products Grab Some of Info '83 Spotlight

(Continued from Page 1)

reportedly maintain confidential files, and the network is said to include an electronic mail option.

Priced at $4,400 per workstation, which includes a 16-bit node serving also as a file server, Northnet is available from GBC at 1500 Broadway, New York, N.Y. 10036.

Wordplex's Wordlink local-area network reportedly permits up to 16 electronic typewriters to be linked to a single Wordplex 80-4 information processor via telephone voice-grade cable.

The processor reportedly performs text editing functions on documents that have already been stored, with a capability for simultaneous receiving of documents from the workstations. Electronic typewriters that can be used on the network must have an RS-232C communications port.

Priced at $450 per node, Wordlink is available from Wordplex at 141 Triunfo Canyon Road, Westlake Village, Calif. 91361.

Xerox Endorses Fax

Xerox Corp. endorsed facsimile technology with a new desktop facsimile terminal that it said can communicate with computers and be integrated into office networks.

The Xerox Telecopier 295 digital facsimile transceiver can reportedly receive computer information for printing or redistribution to other fax units located anywhere in the world. It is compatible with other Group 3 facsimile devices, Xerox said.

The unit's two major options include an RS-232C interface port and a facility that permits product compatibility with lower speed Group 1 and Group 2 fax machines.

The 294 carries a base price of $4,600. More information is available from the Xerox Office Products Division, 1341 W. Mockingbird Lane, Dallas, Texas 75247.

Decmate Moves Into Office

Digital Equipment Corp. made its mark at Info '83 with the transformation of its Decmate personal computer into an office workstation with two software enhancements and a price reduction.

The Decmate Office Workstation integrates word processing, personal computing and communications capabilities with a new logon processor file called Easycom and a word processing conversion utility called WPS Convert, according to a vendor spokesman.

The workstation is priced at $4,735, which includes the system unit, a monitor and keyboard and the software capabilities. It is covered by DEC's recently announced 90-day, on-site service plan [CW, Oct. 3].

DEC is located at 146 Main St., Maynard, Mass. 01754.

Nixdorf Terminal

Nixdorf Computer Corp. last week introduced its 8810 Professional Workstation, which serves as an intelligent terminal tied into a range of Nixdorf systems or which can be used in stand-alone mode.

As an interactive terminal, the 8810 reportedly connects to the Nixdorf 600 series distributed system. Tied to an 8870 Data Processing System, the workstation reportedly has access to application programs for banking and commercial applications.

The 8810 includes a 12-in. amber-on-black display with an 80 char./sec printer.

The 8810 is priced at approximately $4,000. More information is available from Nixdorf at 300 Third Ave., Waltham, Mass. 02154.

Lee Data Controller

Topping the list of communications products was Lee Data Corp., with a dual-host controller said to feature a dual remote-host access capability that increases the functional capabilities of individual display stations in a system.

The Model 311 controller reportedly contains two remote communications interfaces operating concurrently to enable display stations to switch between one of two selected IBM or compatible mainframes.

The 311 can also reportedly be configured to provide application redundancy or host backup capabilities and operates in any IBM protocol Binary Synchronous Communications (BSC) or Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) combination, supporting up to 32 display stations and printers.

Priced at $14,215, the controller is available from Lee Data at 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

Also introduced last week was a protocol converter from Three R Computers, Inc.

The PA1000 is said to provide entry to IBM environments via a coaxial cluster controller connection for any Ascii terminal, personal computer, portable computer or other device.

Connecting to an IBM 3274/3276 cluster controller supporting BSC or SNA/SDLC environments, the PA1000 reportedly permits access to asynchronous hosts, public information services or time-sharing services.

Priced at $995, the PA1000 is available from Three R Computers at 18 Lyman St., Westboro, Mass. 01581.

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Why?

Electronics Industry Relieved

House Democrats Put Immigration Bill on Ice

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The manpower-starved electronics industry got a reprieve recently when Democrats in the U.S. House of Representatives pulled the plug on a controversial immigration bill that would have limited availability of foreign technical workers.

The Immigration Reform and Control Act, now apparently on the shelf for at least another year, was also viewed by civil liberties advocates as a great threat to personal privacy in this country. The bill called for a worker identification system, which some feared would be a de facto national ID system [CW, May 30].

The bill, which has passed the Senate twice, was headed for House consideration when Speaker Thomas P. O'Neill (D-Mass.) early this month decided not to let it come up for debate this year. Because of the controversial nature of the legislation, it is not likely to be reintroduced in 1984, an election year.

The bill's centerpiece was a provision to penalize employers who knowingly hire illegal aliens. Hispanic groups feared employers would resist hiring Hispanics and other minorities to make sure no illegal aliens got jobs.

O'Neill noted the opposition to the bill from Hispanic groups and said he feared President Reagan, although claiming to support the bill, would veto it to curry favor in the U.S. Hispanic community.

Rep. Robert Garcia (D-N.Y.), chairman of the House Hispanic Caucus, hailed the action of "our great speaker Thomas 'Tip' O'Neill," but other members of the House and Senate who have worked on the legislation for years strongly denounced the move as a blatant Democratic attempt to attract Hispanic votes. Rep. Dan Lungren (R-Calif.) rose in the House to exclaim that "the stench from the rotting carcass of arrogant political partisanship lies heavily on the air of this chamber today."

The White House, which has criticized certain portions of the bill, reiterated its support for the legislation and said it hopes O'Neill will reconsider his decision to withhold it from House debate.

The electronics industry, however, reacted with a sigh of relief. As considered in the Senate, the bill would have required all graduating foreign students to return home for two years before they could seek jobs in the U.S.

The House version would have permitted the Secretary of Labor to waive that provision for alien degree holders who received job offers in certain areas considered to have manpower shortages. The electronics industry had labored long and hard to have the bill amended to include that waiver but was also loath to accept any government regulation of its hiring practices.

Now that the bill has been temporarily shelved, "it will be business as usual," remarked Pat Hill Hubbard, American Electronics Association vice-president for engineering education. It will still be hard to fill all of the industry's manpower needs, "but at least that issue is not going to be compounded" by government regulation, she told *Computerworld* last week.

"Illegal immigration is a real serious issue," she said, but added that the foreign student provision "was always misplaced" because it is an issue of legal immigrants and not illegal aliens, the main target of the immigration reform bill.

"The immigration bill was going to cause problems for us" even with the House amendment, Hubbard said. She noted the matter most likely will come up again and said the association is "hoping we don't lose ground" when it does.

Privacy Concerns

Just as the employer sanction provision alarmed the Hispanic community, it was also cause for concern among privacy advocates. In order to hold employers accountable for hiring illegal aliens, the government would have to provide a secure and reliable way for employers to identify workers eligible to hold jobs in the U.S.

The bill would have directed the administration to develop such a system, and one method discussed would be to issue ID cards, backed by a computerized data base accessible by employers that could be checked to verify employment eligibility. The government estimated this type of system would cost almost $2 billion in the first five or six years alone.

Privacy advocates argued that the system would be too expensive, too difficult to enforce and plagued by fraud. In addition, the system plan is seen by opponents as a national ID system that could be misused by government agencies.

used by goverment agencies. The White House also said it did not approve of this provision but it had concluded the need for immigration law reform outweighed the privacy concerns.

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INFORMATION SERVICES

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International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

AUSTRALIA

SYDNEY — Australia's largest private bank, Westpac Banking Corp., has ordered a triple-processor Tandem Nonstop II System and Base 24 software from Tandem Computer, Inc. Westpac is thought to be the first private bank here to make a commitment to on-line customer services similar to those already offered by state banks. It is also the first bank to use Tandem equipment.

BRAZIL

MANAUS — Secretary of the Treasury Ernane Galveas assured the executive secretary of Brazil's Special Department of Informatics that information technology is high on the list of government priorities for importation. To facilitate further the flow of technology in and out of Brazil, the government has established a duty-free port here.

CHINA

BEIJING — China is developing highly sophisticated computer technology for military purposes, but lagging far behind in general application of computers, according to Wambil Lee, a lecturer from the University of Hong Kong who recently visited here. Lee urged the Chinese to buy general-purpose computers from foreign vendors instead of trying to invent their own. China can learn and copy from the equipment, Lee said, arguing that there is no guarantee that the computers China produces itself will be as good as those already on the market.

FRANCE

PARIS — More information has leaked out about the French postal, telephone and telegraph (PTT) administration's intention to produce a microcomputer version of its Minitel videotex terminals. PTT sources report that two solutions are being considered: the development of a completely new series of Minitel terminals that include keyboards, CRTs and peripherals; and an upgrade of the existing Minitel terminals by equipping them with 8-bit configurations. All of these modules would then be connected with a bus developed by PTT. The PTT rumors sent French microcomputer vendors scrambling for the contract. Meanwhile, Apple Computer, Inc. is expected to announce a universally applicable board to connect its Apple II micros to videotex environments.

ITALY

MILAN — After a recent summit meeting of the IRI — Italy's industrial and government policy officials — the vice-chairman of Italy's national telephone organization known as SIP, along with the director of Italcable, Italy's International and Intercontinental Telecommunications Service, resigned from their offices. Gianfranca Mossetto, the former SIP vice-chairman, sharply criticized SIP management and policy, arguing that increasing phone rates is not the answer to problems at SIP. Giovanni Pinto, the former director of Italcable, reportedly resigned his office because of deeply rooted but unspecified differences with the IRI.

JAPAN

TOKYO — Toshiba Corp. has introduced a 32-bit superminicomputer for engineering and laboratory automation called the Tosbac Data System 600/40, along with an application system called the Super Drafting System. These products, which will be available in January, will be priced at $56,000 and $108,000, respectively.

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TOKYO — Sord Computer Corp. has enhanced its 8-bit microcomputer, the M 243. The improvements include a doubling in the system's processing speed, the ability to connect three terminals and Japanese word processing capability. The standard system, which includes a keyboard, two floppy disks and a CRT, is priced from $2,956.

SWEDEN

STOCKHOLM — Asea, the Swedish electrical, nuclear and robotics giant, has unveiled its first "seeing" industrial robot. The system consists of a television camera, a computer and the robot itself. Through advanced image-recognition technology, the robot can reportedly recognize the pieces it needs to manipulate in a factory assembly-line environment. The machine is said to be capable of recognizing up to 99 different objects.

WEST GERMANY

MUNICH — Siemens AG has expanded its 7500 series of systems with the introduction of two additional families: 7550-X, which will include three models; and 7570-X, which will consist of four systems. The performance of the company's proprietary BS 2000 operating system on the new products will reportedly reach 7 million instructions per second, which is approximately 50% greater than with previous models. The systems are scheduled to be available by next summer.

The Suit and Chip proudly debut their baby.

"To look at it, would you guess it has the power of an IBM mainframe?"

The Suit beckoned us closer. "For the VM/CMS users, and there are some 600,000 them concentrated in big business, financial inst tutions and government, this little baby means new life for their existing programs and applications."

AT&T's Brown Urges Congress to Stay FCC Plan

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — "It's too late for Congress to have second thoughts" about deregulation of the telephone industry, AT&T Board Chairman Charles Brown told every member of the House of Representatives and Senate earlier this month in a letter sent to persuade them not to enact pending legislation modifying the Federal Communications Commission's (FCC) access charge plan.

The FCC plan shifts costs from long-distance communications users to all users by charging for access to AT&T's long-distance network. It has enabled AT&T to propose substantial reductions in several of its interstate rates [CW, Oct. 10] — a reduction that will disappear, the company has said, if the legislation is enacted.

A major reason for the pending legislation is congressional concern that rates will increase to a point where universal telephone service will be jeopardized. However, in a letter to the FCC, AT&T Assistant Vice-President William R. Stump offered evidence reportedly showing that the FCC's pro-competitive policies and the impending divestiture of the telephone company will not increase rates for local ratepayers.

Stump's key point was that although divestiture reportedly has generated "over $9 billion" in rate increase requests from local telephone companies, "some $2 billion is actually carrier access charges, not customer charges." But even if this fact is ignored, the $9 billion plus in increases, if all of them were granted, would increase residential rates "7% to 12%, or about $1.65/mo, assuming the midpoint of the range," Stump told the commission.

Referring to a recent analysis of residential usage in five states, six months before and after large increases were authorized, Stump said the studies show it is "absurd" to argue that the pending rate increases, if granted, will lead to a significant reduction in the number of residential subscribers.

Besides shifting costs from long-distance users to all telephone network subscribers, the FCC's access charge decision also has changed the shares assigned to telephone and nontelephone interstate carriers. Under the present system, which will end Jan. 1 if the access charge plan is implemented on schedule, interstate telephone carriers — consisting chiefly of AT&T Communications — pay a "separations/settlements" charge to each local telephone company, which subsidizes the latter's costs. Other common carriers pay a similar but smaller fee for inferior access; that fee is generally known as the Exchange Network Facilities for Interstate Access arrangement.

Under the FCC's new plan, this differential will drop considerably, according to the other common carriers, and leave them at a competitive disadvantage. "The very survival of the [other common carrier] industry is threatened," the eight largest carriers told the FCC early this month.

Other Actions On Access Plan

WASHINGTON, D.C. — In other actions related to the Federal Communications Commission's (FCC) access surcharge decision:

- AT&T told the FCC earlier this month that the existing separations/settlements process "can no longer function as currently designed following divestiture." Redesigning it "would impose tremendous costs on the Bell operating companies and AT&T," the company said in reply to petitions filed by Western Union Telegraph Co., the Association of Data Communications Users and others that seek a delay of several months in imposition of the access surcharge plan.
- An intrastate access surcharge system similar to the one developed by the FCC for interstate services has been adopted by the Iowa Commerce Commssion. Beginning Dec. 1, a $2/mo surcharge will be imposed on each residential line and a $6 surcharge on each business line. In addition, the commission has added 3 cents per minute to the charge for each intrastate call.
- MIT Director of Telecommunications Morton Berlan told the FCC earlier this month that it will cost MIT an extra $800,000 if the commission does not modify its access charge decision to reduce the surcharge levied on Centrex-CO users. The basic problem is that the surcharge is imposed on each access line; Centrex-CO users, since they have many more access lines, pay considerably more than private branch exchange users.
- Dr. Alfred Kahn, economic adviser to President Carter and former chairman of the New York Public Utilities Commission, called the FCC's access charge plan "an intelligent decision, a moderate decision and a courageous decision." In hearings earlier this month before the Joint Economic subcommittee, Kahn said that while the present subsidy paid by long-distance users toward support of local telephone networks has served a useful social purpose, it is too large.

A 'personal mainframe' no less.

The Chip chimed in. "It is a personal mainframe that provides greater productivity for the individual user, enhances the performance of existing applications, leverages a company's investment in IBM systems and software, and provides access to sophisticated, modern computing environments such as FOCUS™ and RAMIS II™

—and all at a price affordable by the single user."

We were talking with the Suit and the Chip at their new headquarters in Trumbull, Connecticut. They founded Canaan Computer Corporation in 1981. Prior to that, the Suit, Bob Bernard, was the founder of National CSS, a leader in the development of commercial time-sharing. The Chip, Nick Pisarro, was a major technical contributor there. We asked what makes the Canaan Computer stand out of the teeming mass of new computers.

CMS user freed at last.

"It's simple," explained the Suit. "Recent developments like multi-window graphics and Ethernet™ are giving some buyers of new computers vastly increased capabilities. But as far as the IBM mainframe user has been concerned, these new powers don't exist. The CMS user has had to be satisfied with decade-old technology. With the introduction of the Canaan Computer, that CMS user can now have it all."

Multi-window graphics, dedicated interactivity.

"What we have done," said the Chip, "is develop a machine that provides these state-of-the-art capabilities, and runs the user's IBM mainframe programs with no changes required. So, for the very first time, CMS users , or even non-users who want to take advantage of all that IBM software , can have very high-resolution graphics, networking for shared resources, super interactivity, more computing power than they can ever get on a shared centralized computer—and all in a package the size of a two-drawer file cabinet."

Multi-window graphics, local area networking, a dedicated processor for each user: is there anything else you want the business community to know, we asked?

"Yes," said the Suit. "Our address. So they can write or call for more information. Or to order a machine—they're ready for delivery now. It's Canaan Computer Corporation, 39 Lindeman Drive, Trumbull, Connecticut 06611 (203) 374-5592. Ask for the Suit."

CANAAN

User Sees Positive Side to AT&T Deregulation

CW
At NRMA

(Continued from Page 1)

perspectives — to prove . . . that telecommunications is a resource to be managed to increase the revenue potential of your corporation and [that] it's not just an expense."

Deregulation should really not alter the goals of a communications manager, according to Livingstone. "What Montgomery Ward is doing is no different from what we would have done without deregulation — provide cost-effective telecommunications services for our corporation."

But when he joined the organization one year ago from Rockwell International Corp., Livingstone said, Montgomery Ward "was designed to work with a monopoly. In essence, we said to Bell, 'Go on out there and engineer a system, tell us how much it will cost and we will contract it.' "

That attitude has changed, he added, and the decision has been made to purchase telecommunications services and products on a competitive basis. The retail chain's communications equipment is outdated and overpriced, but "deregulation will allow me to come out from underneath lease agreements that are too long."

Montgomery Ward's strategy, according to Livingstone, who worked in DP for eight years before spending another eight years in telecommunications, includes developing in-house resources that were once left to AT&T's personnel. Those resources, he said, include expertise in network design and analysis, inventory management, change management and billing management. Regulatory and tariff management is addressed through a consulting group that has hired a firm to keep track of tariffs nationwide. And in the area of planning and control, "We've used deregulation as an excuse to get [the resources] we need."

Concerns in the corporation, he said, include the changing vendor environment, the increased number of marketing entities and the product technology explosion.

Livingstone said the situation provides opportunities for internal reorganization; controlling expenditures; upgrading functionality and efficiency; using the company's leverage to induce such things as volume discounts and favorable maintenance agreements; and positioning networks to minimize tariff vulnerability, merge voice and data and add value-added services.

He also advised automating internal functions such as ordering, billing verification, inventory management and optimization. "You'll have the ability to react quickly," he noted.

Justice Leaves CAB to Probe Airline Nets

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Justice, having completed the first phase of its investigation into computerized airline reservation systems, said recently it agrees with the Civil Aeronautics Board (CAB) that industrywide regulation is needed.

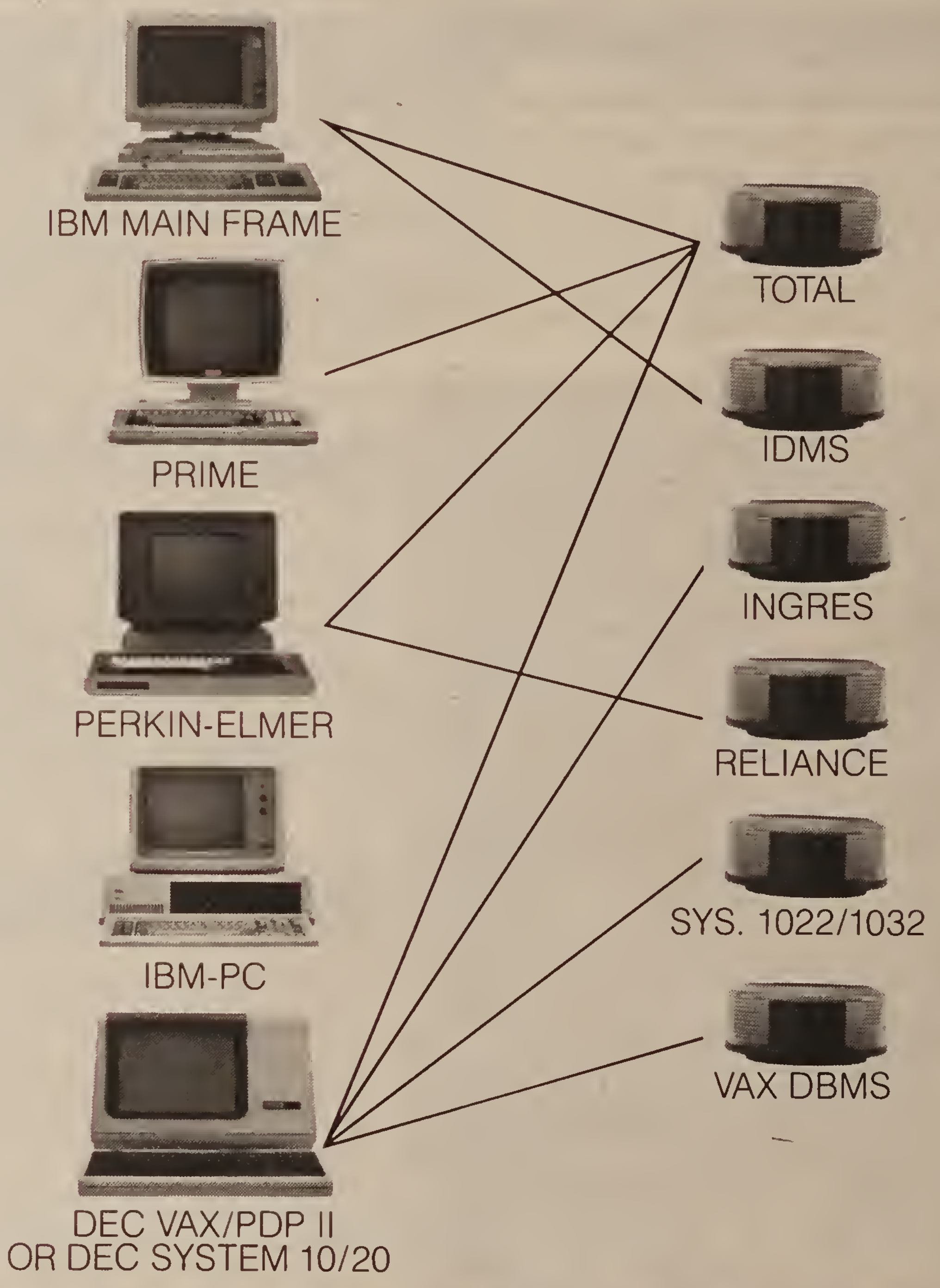
But the department backed away from an earlier stance that the investigation should be primarily handled within the Justice Department and said it would cooperate with the CAB's current effort to develop those regulations.

Both agencies have been investigating complaints that the providers of the computerized airline reservation systems are using them in anticompetitive ways. American Airlines and United Airlines, which through their Sabre and Apollo networks control most of the more than $20 billion in annual computerized reservation business in this country, have vigorously denied that their systems are used to stifle competition in any way.

The CAB, however, decided recently that specific regulations are needed to guide the use of the computer systems and has requested public comments, due today, on its effort to develop those rules by early next year [CW, Aug. 15].

The Justice Department, which is continuing its own investigation, had asked the CAB in April to hold off and allow the department to take the lead in this inquiry [CW, May 2]. In an Oct. 5 filing with the CAB, however, Justice Department Antitrust Chief William F. Baxter said his office will cooperate with the CAB rule-making procedure and defer acting on its own until the CAB action has been completed.

The agency also revealed that it has interviewed more than 100 people and reviewed more than 100,000 pages of documents. The Justice Department said it needed more time to put this material in a format to help the CAB and requested an additional month to deliver its comments for the CAB inquiry. The department said it will file "comprehensive, substantive comments and proposed rules in this proceeding."



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Fears High Rate Increases

Consultant Cites Problems in AT&T Breakup

CW
At NRMA

By Peter Bartolik
CW Staff

CHICAGO — The compressed time frame of the pending Bell system divestiture is leading certain interests "to try to take advantage of the situation," according to a consultant who is studying the situation for some of the largest retail chains in the country.

William Page Montgomery, vice-president of the consulting firm of Economics and Technology, Inc., pointed out several problems in the current process during a meeting last week at the National Retail Merchants Association's (NRMA) 25th Annual Retail Systems, Technology and Communications Conference. Montgomery's firm represents several large corporations, including Montgomery Ward & Co., Inc., helping them to keep track of tariff requests and to file rate arguments before regulatory agencies.

Telephone companies at the state level, Montgomery told the NRMA, are "mirroring" rate requests that have been filed with the Federal Communications Commission (FCC). "A lot of local telephone companies are telling states [regulatory agencies] that their rates [for certain intrastate services] must be the same as those filed with the FCC for interstate services. . . . The result would turn out to be a bigger rate increase than would otherwise be," he declared.

Bills being considered by Congress that would alter aspects of divestiture by AT&T contain provisions that would place taxes on the development of alternatives to Bell operating company services, according to Montgomery. "We see these bills as a vehicle to tax business and in particular to tax new technology."

The legislation being considered is supported by consumer groups that have "a misconstruction of the facts about what will happen" and by smaller telephone companies that over the years have obtained lucrative rate provisions they want to protect, Montgomery claimed. "In some states, they make out like bandits," he added.

Montgomery said his firm maintains a data base on telephone tariffs, and recent submissions will probably double the size of that data base. It is too early to analyze how all the rate requests will impact business, he added.

His firm is advising clients not to devote any resources in the remaining months of this year on telecommunications systems. "The dust is settling," he said. "Wait a little longer, and you'll be able to see more clearly in terms of management planning issues."

Most of the impact of divestiture is becoming clearer, he added, except for the impact of surcharges on data networks. "This is an area that we're going to have to look at carefully in terms of planning," he said. But Montgomery thinks surcharges are one area that will be changed because of widespread opposition.

Cable TV Bill Reaches House

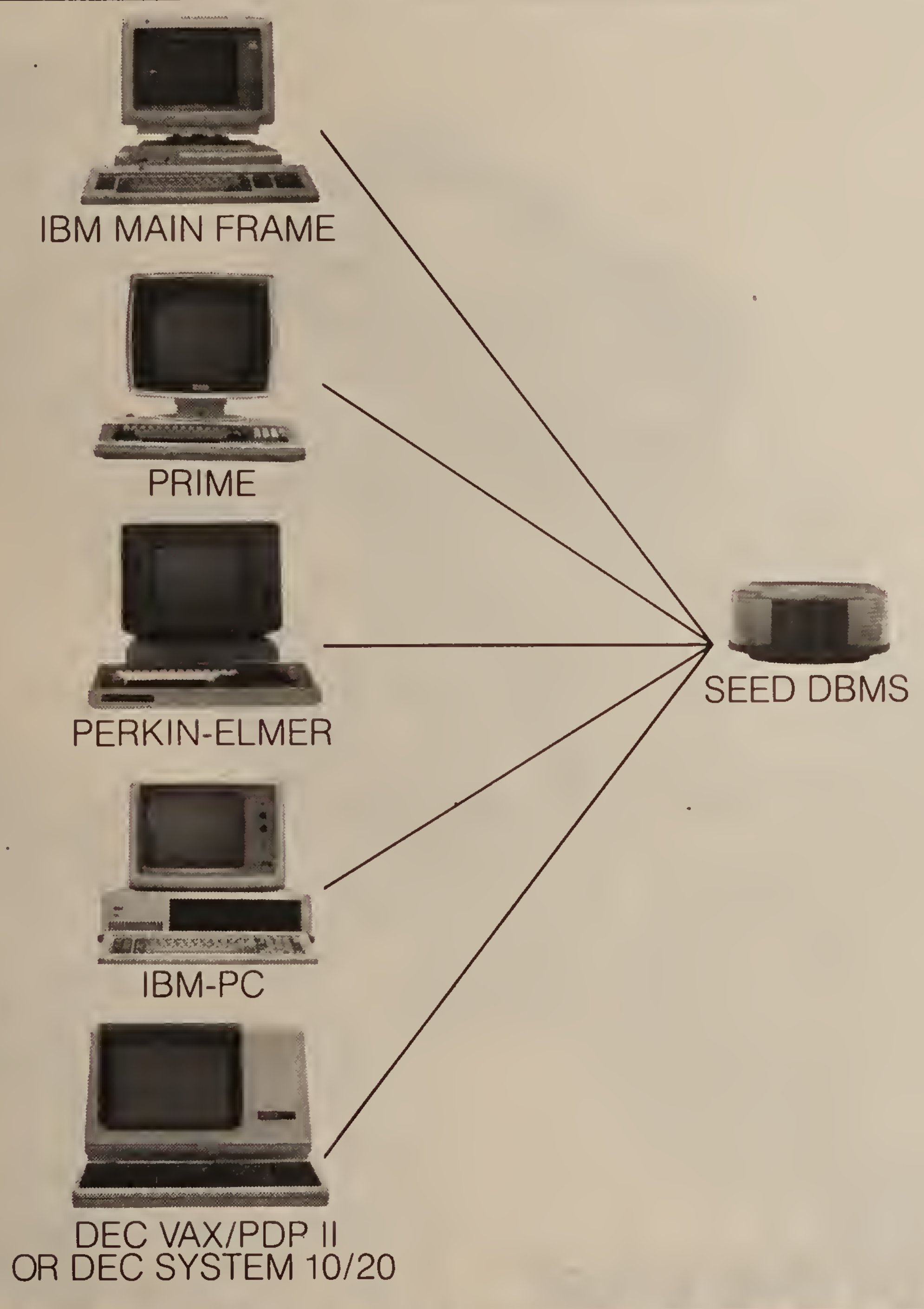
WASHINGTON, D.C. — A cable TV bill permitting regulation-free bypass of the telephone network was unveiled in the House of Representatives earlier this month.

If cable TV operators are allowed to offer data transmission services free of regulation, users in a number of cities might be able to communicate with intercity networks without having to go through their local telephone systems.

However, telecommunications legislation pending in both the House and the Senate still would require users of such bypass facilities to help support their local phone companies. The legislation imposes a surcharge on any circuit that can be used in place of local exchange facilities.

The legislation introduced in the House last week by Telecommunications Subcommittee Chairman Tim Wirth (D-Colo.) — H.R. 4103 — has 22 cosponsors, enough to get it passed by the subcommittee. But neither Rep. John Dingell (D-Mich.), chairman of the parent House Commerce Committee, nor Rep. James T. Broyhill (R-N.C.), its ranking minority member, has endorsed the bill. Subcommittee hearings are scheduled to begin late this month.

One provision of H.R. 4103 "prohibits common carrier or utility regulation of cable systems offering data transmission services," a subcommittee spokeswoman explained. This provision reportedly is similar to language in a cable TV bill (S. 66) passed by the Senate last summer over the opposition of AT&T and the National Association of Regulatory Utility Commissioners.



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EFT Acceptance, Direction Debated

By Peter Bartolik
CW Staff

CW
At NRMA

CHICAGO — The presence of an electronic funds transfer (EFT) capability at or near the retail checkout counter is rapidly growing and seemingly accepted in the retail industry. But questions remain about the type of technology that will dominate, the ownership of equipment and who will make a profit.

Differing views about what direction the technology and consumer retailer acceptance will take emerged during a panel discussion and an interview held here last week at the National Retail Merchants Association's 25th Annual Retail Systems, Technology and Communications Conference.

Recent studies — including one from the Federal Reserve System indicating consumer acceptance of debit cards — and development of shared automated teller machine (ATM) networks into national EFT access systems seem to have sparked increasing vendor and user interest in EFT at the retail level. Throughout the year, press releases have come at a furious pace announcing experiments in direct-debit point-of-sale (POS), automated gasoline dispensers that will accept credit and debit cards and supermarket and convenience store chains locating ATMs on site.

"There seems to be some consensus that [EFT] is going to be the wave of the future and eventually is going to happen," declared Steve Clarkson, systems support manager and EFT coordinator for Lucky Stores Corp. "But the question is how will it happen; who will own the equipment — banks, retailers or a third party — and who pays for it?"

Helen Tepperman, vice-president and manager of business services for Wells Fargo Bank, said her organization already offers direct-debit POS to bank customers shopping at Livingston Brothers, Inc. women's fashion stores in northern California and at Shell Oil Co. gasoline stations. It recently entered into Interlink, a shared POS system, with four other major banks in California. But, she said, the big question remains consumer acceptance.

Tepperman said banks have acclimated consumers to "float," whereby payments on purchases are deferred for up to 45 days, and consumers also have questions about security. When a question arises on a credit card purchase, the consumer refuses to pay, and either the retailer or the bank extending credit is "out" the money; with a debit card purchase, however, "if you rip the money out of the consumer's account, it is going to be his life insurance payment that bounces next month."

Wells Fargo, according to Tepperman, is relying on heavy consumer education campaigns and promotion gimmicks — such as discounts on purchases — to convince consumers to do business on a direct-debit basis.

Third-Party Services

Doug Brooking, president of Comet Corp. and its third-party switching service, Cashex, which connects retailers to banks, said retailers might be well-advised to select a third-party system rather than contract with a bank or purchase their own system.

Success of direct-debit POS, Brooking said, depends on large volume, must be profitable and must be accepted by consumers. Part of that acceptance, he said, depends upon customers of various banks being able to access funds at the same grocery store.

"You don't want customers to perceive that you're pushing a particular banking institution," he said.

Helene Duffy, principal of the consulting firm of Duffy & Duffy, which was instrumental in merging shared regional ATM nets into the national ATM net now known as Nationet, has long urged bankers to get their EFT act together before somebody else steps in. At last week's discussion, she seemed to concede that bankers may have missed the boat.

"You have a host, a variety of approaches to move into EFT areas; there are some 200 shared ATM networks around the country, and many of them have switches. Retailers might even decide to buy ATMs and link them into those switches," she said.

She referred to the recent announcement made by Publix Supermarket, Inc. in Florida that it will establish both ATM and direct-debit POS systems in the statewide grocery chain.

CW Photo by P. Bartolik

EFT may be a sure thing, but major questions remain to be answered, Steve Clarkson said.

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Stresses Training, Support for End Users

Exec Outlines Sears Roebuck's Plan for Micros

By Peter Bartolik
CW Staff

CHICAGO — Providing end-user computing capability where it is required is the "mission" of data processing professionals at the Sears, Roebuck & Co. retail organization.

Robert L. Wieseneck, national manager of Systems Planning and Information Services for the retail giant, told a session at the National Retail Merchants Association's 25th annual Retail Systems, Technology and Communications Conference that the growth in end-user computing has just begun and urged DP professionals to contribute.

"Your DP department can make the greatest contribution by offering planning and gaining the respect of end users," Wieseneck said.

At Sears, a decision was made in 1981 to offer direction with regard to the proliferation of microcomputers. Without such direction there would have been chaos, Wieseneck said.

"Our mission was to provide all of the end users' necessary tools," he said.

Sears selected one microcomputer for corporate use, the IBM Personal Computer, and established training and support services for users.

"That allows us to better integrate with existing office systems," Wieseneck said.

CW At NRMA

Sears presently has 100 integrated office systems in use and plans for more than 500 by next summer.

Wieseneck's department has also established similar services for end users with regard to mainframe computers.

Sears' Information Services Department is organized into two groups: mainframe support and micro support.

The mainframe support group has trained 300 end users who have developed 500 applications; the micro support group, according to Wieseneck, has trained 800 end users who have trained another 400 people to use the Personal Computer for specific packages.

According to Wieseneck, an information services manager develops, promotes and monitors systems, while information services consultants each develop expertise on a particular software product. The consultants identify user requirements, recommend hardware, coordinate long-term planning and administer software.

In the mainframe area, the program runs formal classes in basic and advanced computing, with hands-on training and instant instructor assistance; an information services user guide has been published; and a menu-driven approach to accessing data has been implemented.

On the micro side, employees "from every area and job description" have been educated on the Personal Computer; all end users initially were trained to use Visicorp's Visicalc and lately have been trained with Lotus Development Corp.'s Lotus 1-2-3; a micro newsletter provides information on new products and programs that have been written by other Sears end users and are distributed by the Information Services Department.

The biggest challenge ahead, Weiseneck said, is to offer communications as end users seek access to other end users and to the mainframe environment.

"The trend in end-user computing has just begun and will continue to grow," he said. "End users contribute to that growth. Most users are no longer afraid of computers — they are fascinated."

Workshops To Target DP Crime

SAN FRANCISCO — The International Association of Computer Crime Investigators is holding a three-day workshop on computer crime here this week at Golden Gate University. The workshop will be repeated in Chicago on June 6-8, in New York on Sept. 19-21 and in Washington, D.C. on Sept. 26-28.

The workshop is designed for investigators, prosecutors, security officers, electronic data processing auditors, attorneys and other officers responsible for protecting company assets. Its purpose is to provide the investigator with effective tools for case planning, evidence gathering and identification, use of expert witnesses and case presentation.

The registration fee is $425. A 20% discount will be available for single organizations that register three or more members.

Additional information is available from the International Association of Computer Crime Investigators, Suite 8F, 1100 Gough St., San Francisco, Calif. 94109.

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Opportunities Seen Bleak for Retail DPers

By Peter Bartolik
CW Staff

CW
At NRMA

CHICAGO — Successful DP professionals in the retail industry who hope to move up to general management positions face long odds, burdened with corporate perceptions that they are specialists.

That was the bleak observation delivered by a chief executive officer in the keynote address last week at the 25th annual meeting of the National Retail Merchants Association's Retail Systems, Technology and Communicatons Conference.

Carroll E. Ebert, chairman and chief executive officer of Carson Pirie Scott & Co., said that retail corporations tend to select key executives first from the ranks of operations personnel. "The contoller and financial executive also appears to have the inside track," he said.

Speaking to a large audience dominated by management information systems personnel, Ebert declared, "Your ability to move up and out into general management is probably frustrated."

DP professionals in the corporate environment are generally considered to be specialists and are not considered to be merchants, according to Ebert.

He said the key factor in promotion to upper executive management positions is the quality of "being a good merchant."

The credentials of top executives "usually reflect a career with a long string of rapid promotions ... typically in buying areas," Ebert said. "Management of that area of a company is almost totally precluded to the management of information services."

While conceding the difficulty, Ebert said, "There should be opportunities for managers of your skills to move into finance and operations."

He recommended that DP executives consider educational improvement, such as obtaining a master's degree in business administration.

On the job, DP professionals who hope to move up "should think and act as major store executives . . . [and] try to be an important resource to the personnel executive, operations executive and finance executive." They should also personally involve themselves in the conceptualization, development and implementation of all new information systems.

DP hopefuls face a similar problem to women executives hoping to climb the corporate ladder. Ebert noted, "There are not enough of them in the top ranks today."

DP executives should try and "infiltrate" the ranks of corporate networks by developing their subordinates.

"Looking forward, I see a spectacular opportunity for you," Ebert told his audience. "You are unusually blessed with paying the highest starting salaries. Pick carefully and look for potential corporate presidents. Hire these people and train them and work with personnel management to transfer them in the first three to five years to the areas of finance and operations."

Common Meet Slated for Oct. 22

CHICAGO — Common, the IBM user group, will hold its Fall 1983 Conference at the Phoenix Hilton from Oct. 22 to Oct. 26.

A highlight of the conference will be several presentations on the introduction of the IBM Personal Computer into the corporate setting. IBM will provide information on the latest technical aspects of its product.

Among the speakers at the conference will be Lou Veltri of Software Plus, Inc.; Tom Longman from The Systems Center, a Texas firm; Steve Papermaster of MCM Systems of Texas; Don Chapin of CBIS Corp. in New York City; and Ron Berry of Peerless Engineering in California.

Preregistration fees are $100 for members and $160 for nonmembers. On-site registration fees are $130 for members and $180 for nonmembers.

Further information on the users group meeting is available from David G. Lister, Administrative Director, Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

VSE Users Group To Elect Officers

WALTHAM, Mass. — The New England Users of VSE, a group of technical systems support staff within the IBM DOS/VSE user community, will hold elections for officers on Nov. 30.

The group, which focuses on how to use, support and evaluate IBM operating systems, holds monthly meetings. The meetings include a discussion and a forum for users to share problems, solutions and shortcuts.

More information about the group is available from its president, Terry Spalding, at the New England Journal of Medicine, 1440 Main St., Waltham, Mass 02254.

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More Vendors Eye Asynch-3270 Compatibility

By Ed Scannell
CW Staff

NEW YORK — With an increasing number of Fortune 1,000 firms complementing their IBM mainframes with superminicomputers made by companies such as Digital Equipment Corp. and Data General Corp., several terminal manufacturers attending this year's 10th International Information Management Exposition & Conference (Info '83) said they have added or plan to add asynchronous communications abilities to their IBM 3278-compatible terminals.

In the not-too-distant past, the only way the 3278 and compatible terminals could communicate with an IBM mainframe was bisynchronously. This meant 3278 users were captives of the IBM environment and unable to access the data bases of the asynchronous non-IBM superminis and mainframes.

However, the demand from many Fortune 1,000 companies for the distributed processing capabilities of the DEC and DG superminis has recently become so great that makers of 3270-compatible terminals feel they can no longer ignore it.

The first and so far only vendor to bring to market a 3278-compatible terminal system with asynchronous communications abilities is Lee Data Corp. The company introduced its first asynchronous 3278-compatible terminal, the Series 400 terminal system, earlier this year.

'Target Customer'

"Our target customer is the guy that has five mainframes in one building. We can give him the capability to go outside the IBM world to other vendors' systems," Frederic Sweeny, Lee Data's senior vice-president of marketing, said during an interview at Info '83. Sweeny reported that Lee Data has accounts with 70 of the Fortune 500 companies.

Lee Data's Series 400 can communicate with the DEC VAX-11 supermini as well as with the Decsystem-10 and Decsystem-20 mainframes by emulating DEC's VT52, VT100 and VT132 terminals. Sweeny said Lee Data also plans to make its terminal systems compatible with Hewlett-Packard Co. and DG superminis.

Lee Data has been able to add capabilities to its 3270-compatible terminals without sacrificing any compatibility, Sweeny claimed. Besides asynchronous communications, another capability not available on the 3270 is the ability to download files from all 370-compatible mainframes, manipulate that data locally and send it back to either the IBM mainframe or to a DEC mainframe.

Lee Data unwrapped its latest asynchronous 3270-compatible product, the Model 311 dual-host controller, here at Info '83. The 311 contains two remote communications interfaces that operate concurrently, enabling display stations to switch freely between one of two IBM or IBM-compatible mainframes.

According to a spokesman for Lee Data, this capability should increase cost savings by doubling the range of host applications that can be accessed by one terminal operator.

Sweeny said Lee Data provides its controller unit, which plugs directly into the back of "any 4300 series and up mainframe," to two of its competitors, Raytheon Data Systems Co. and Racal-Milgo, Inc., through OEMs.

However, it does not provide those two firms with the proprietary software that will allow their systems to communicate asynchronously, according to Sweeny.

CW at Info

Bert Hochfeld, marketing director for Raytheon, said his firm is currently working on putting asynchronous communications abilities up on its 3270-compatible terminal system. However, he could not say whether such a product would actually be available.

Likewise, a Racal-Milgo spokesman said his firm is "looking into" making its

(Continued on Page 24)

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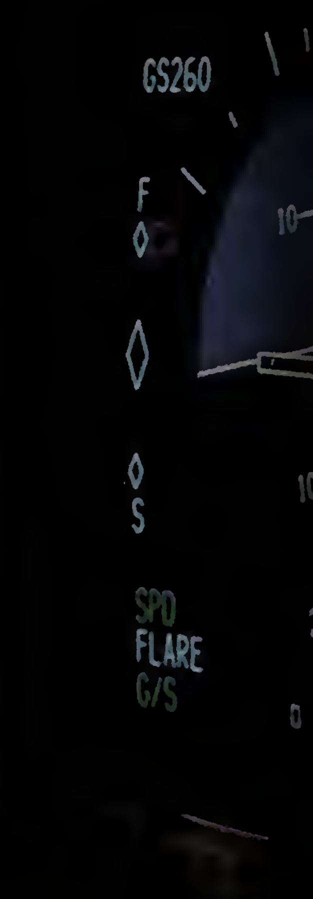

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One Unified Strategy

Users Told Both Micros, Mainframes Need DSS

By Paul Gillin
CW Staff

CW at Info

NEW YORK — Users who are puzzling over whether to implement decision support systems (DSS) on a mainframe or a microcomputer should consider doing both, according to a speaker at the 10th International Information Management Exposition & Conference (Info '83) held here last week.

Chris Brown, a product manager at EPS International, Inc. in Windham, N.H., said the strong trend toward linking micros to mainframes will underscore the need for a DSS strategy that encompasses both kinds of hardware. A distributed DSS, as he termed it, uses micros for financial modeling and data manipulation and then passes the data to the mainframe for more complex modeling not available on micro packages.

One EPS client company implemented the concept after selecting a mainframe DSS and forming appropriate support and user groups. The onslaught of micros forced the company to revamp entirely its DSS strategy to make up for differences in response time, training and complexity.

The company revised its strategy "to use single tools for single problems," Brown said. The three-tiered structure uses Lotus Development Corp.'s Lotus 1-2-3 spreadsheet, graphics and data base package at the micro level for local modeling.

The company also uses EPS' Micro FCS with a tie to the mainframe to handle medium-size applications. Problems that require more intensive computing resources are run on the mainframe using FCS-EPS, a large DSS tool.

Distributed DSS presents some new problems, Brown conceded. Redundancy of data and effort is a concern, as is the loss of control and security at the corporate level.

Incompatibility of different micros can be a problem if the micro-buying strategy is not well articulated and increased support and training are required to familiarize the users with the new structure.

However, distributed DSS reduced time-sharing costs and opened the computers to a much wider base of users, he noted. Current trends in DSS also seem inevitably to lead to a structure in which both kinds of computing are incorporated.

Three Categories

Three categories of distributed DSS are in common use today, Brown observed. One uses spreadsheets on the micro with a separate mainframe-based DSS. This is a relatively inexpensive structure with a large user base and a great deal of idea-sharing between users. However, the incompatibility of the two systems means that files must go through a conversion process to be transferred to the mainframe, the users must learn two different languages and the mainframe DSS features are not available on the micro.

A second strategy uses an identical subset of the mainframe DSS on the micro with a direct communications link and full screen data entry. This structure eliminates the language and incompatibility problems and offers improved flexibility; however, it also extends a great deal of power to users who may not require it.

A third scenario incorporates a micro-style product offered by a mainframe vendor. Such a product typically offers a wider range of mainframe-like features but is usually not completely compatible with the mainframe DSS, Brown said. The user usually cannot transfer all aspects of the micro spreadsheet to the mainframe and has to learn a communications procedure to begin to do so, he concluded.

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Don't Rush Into DSS Arena, DP Managers Say

CW at Info

By Paul Gillin
And David Myers
CW Staff

NEW YORK — Slow and steady wins the race. At least that was the view toward decision support systems (DSS) voiced by DP managers interviewed at random at the 10th International Information Management Exposition & Conference (Info '83) held here last week.

Most of the managers are either in the initial stages of implementing a DSS or are actively looking at tools to provide such support to the users. However, none is rushing headlong into the DSS arena, most preferring to let the wishes of users drive the process.

AFG Industries, Inc. of Kingsport, Tenn., "already has DSS but [does not] have a corporate definition as such," according to Robert Glick, vice-president of management information systems (MIS). Although a coherent strategy for formulating DSS has not been determined at AFG, Glick is interested in "setting out on the micro those things that are portions of DSS without calling them 'DSS' — things like spreadsheets."

However, Dave Redd, AFG programming manager, noted that management is more concerned with reducing the applications backlog than with defining DSS strategies.

"We've installed 15 major applications in the past 18 months, which is probably more than the company has done in the previous five years, and it still isn't enough," he said.

Glick added, "We have to have DSS, but it may not be under that name." He is considering using back-end hardware to tie the users into the corporate data base.

Growing Into One

Although his company has no DSS up and running, Richard D. Tuschick, manager of data systems and services at UNC Naval Products in Uncasville, Conn., said his company is "not necessarily behind. We're growing into one.

"We don't jump into something just because it's trendy. It's got to have a hard payback," Tuschick said.

Tuschick called DSS "more talk than action" in the industry, "mainly because of the expense involved." His company's strategy is to "take smaller steps to get up to a fully integrated DSS. We will be acquiring pieces to fill specific voids and meet immediate needs at a lot less cost."

Bendix Electrical Components of Sidney, N.Y., has had a DSS running for seven months, primarily in the areas of accounting, finance and employee relations. Roy D. Straka, manager of MIS operations, also believes DSS at this stage is more talk than action. "I personally believe it's a trend [created] by vendors to sell hardware and software," he said.

Like many companies, General Electric Co. in Pittsfield, Mass., "doesn't have something called DSS. We have something that provides information to managers from the mainframe," according to Lee Woodry, manager of systems and staff support.

The company is using terminals connected to a minicomputer that acts as a pass-through to the mainframe to retrieve data from the data base.

Woodry said that the location's manager of financial planning and analysis has been pushing for a more formal DSS, but "I haven't been able to get a general manager to push for it."

Coming to Info '83 to "get a survey of what's out there," Woodry said he was impressed by the proliferation of IBM Personal Computers at most companies. "Nearly everybody is using them," he remarked.

A "total solution" may be in the cards for the DSS needs at CBS Radio, a division of CBS in New York. "We see the need coming down the pike because of the proliferation of [IBM Personal Computers]," Steven G. Peppard, director of MIS, said.

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Seven of 10 Managers Polled Plan Local Nets

By Katherine Hafner
CW Staff

CW at Info

NEW YORK — When asked a year ago whether they had concrete plans for installing a local-area network, most DP managers would likely have answered no.

But an informal floor survey of information systems managers at last week's 10th International Information Management Exposition and Conference (Info '83) here indicated that the local-area network is finding its way into an increasing number of offices.

Seven out of 10 people questioned said they have either installed a local-area network or have definite plans to install one in the next few months. And the most frequently cited reason for installing a local-area network is the advantage gained from a shared-resource environment.

Thomas A. McWalters, vice-president of systems and data processing at the Chase Manhattan Bank in New York City, said his office is in the process of installing a local-area network, and he expects it to be finished this year. With a local-area network, McWalters expects to save the cost of expensive cabling while enhancing communications.

W. T. Rush, a partner at Coopers & Lybrand in New York, expects to install a local-area network within a year. His company is looking to a local-area network for its flexibility, providing "a wide variety of terminals with the ability to access each other," he said.

"We've had a local-area network for two years," commented Thomas Stryker, vice-president of operations at Barnett Bank Trust in Jacksonville, Fla., where a Datapoint Corp. Arcnet is in place. "Our local-area network has put processing power right in the users' hands, while data can go directly to the source."

But as for whether local-area networks will ever be truly pervasive, Stryker, among others, has his doubts: "I think there's a place for local-area networks, but I'm not sure what that place is. With so many personal computers entering the office, it's difficult to say. But personal computers can't truly share information; they can only pass it."

Others, such as Hal Womersley, vice-president for data processing at Academy Insurance Group, Inc., said local-area networks may have their place, but it is not with his firm. "We don't really need to go from CRT to CRT," Womersley said. "Local-area nets belong in companies with a strong centralized system that are more oriented toward office automation than large data bases on mainframes."

Links Seen On the Rise

(Continued from Page 19)

3270-compatible terminal systems asynchronous, but he declined to say when that capability would be deliverable.

"Fortune 1,000 firms want one terminal that can access multiple mainframes. Of the Fortune 1,000 companies, about 900 have VAX systems," noted Fred Schlaffer, vice-president of research and development for the Westboro, Mass.-based Three R Computers, Inc.

Schlaffer's firm introduced a protocol converter that allows access to IBM environments via a coaxial cluster controller connection for any Ascii terminal.

Asked why IBM has been slow to react to its customers' needs to hook up with DEC and DG superminis, Schlaffer said he suspects IBM is waiting for the DECs and DGs of the computer industry to come to the bisynchronous world instead of waiting for IBM to commit to the asynchronous world.

"IBM has never offered any support for asynchronous. [It] doesn't want . . . DEC and [Prime Computer, Inc.] to be able to access its equipment," Schlaffer speculated.

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Three Factors Seen Critical in Micro Integration

CW at Info

By Ed Scannell
CW Staff

NEW YORK — Large corporations planning to equip all levels of staff and line management with microcomputers should carefully consider how they are going to integrate the micros into their particular corporate environments.

This advice was dispensed during a panel discussion called "Personal Computers in Large Companies" at last week's 10th International Information Management Exposition & Conference (Info '83) here.

According to session chairman Alan Goldberg, director of management advisory services for the Detroit-based Deloitte Haskins & Sells, management information systems (MIS) personnel must consider three important factors when integrating large numbers of microcomputers into their organizations: hardware, software and communications.

The first hardware dilemma MIS directors must solve is whether they need an 8- or 16-bit system, Goldberg contended. "If you have an application that you think needs more than 128K [bytes] of memory, you will need a 16-bit system," he said.

Once that decision has been made, MIS directors must then decide from which one of the 100 or so microcomputer manufacturers they want to purchase their systems. Goldberg said companies planning to place very large orders will probably have to buy from more than one vendor. "For instance, [Hewlett-Packard Co.'s HP 150] is a good engineering machine; IBM's Personal Computer is a good general-purpose machine; and [Wang Laboratories, Inc.'s Professional Computer] is good at word processing," he observed.

CW Photo by L. Haber

Rick Inatome told Info '83 attendees that the products appearing to be de facto standards today may be quickly overtaken by their competitors.

However, Goldberg added, perhaps the most important consideration in selecting a vendor is knowing that it will be around for a few years to support the micros.

The third hardware issue that must be addressed is media. Goldberg suggested that companies purchasing systems from a number of manufacturers make sure they can transfer disks back and forth among the machines. "When there is no [media] compatibility, there can only be trouble," he warned.

Market Share

Rick Inatome, president of Computer Mart, based in Troy, Mich., said it is important that MIS directors in the process of selecting the proper hardware, software and communications be aware of the market share each product holds. Inatome suggested that MIS directors purchase products they can "standardize around."

However, he counseled session attendees, products appearing to be de facto standards today, such as Visicorp's Visicalc spreadsheet, may be quickly overtaken by their competitors.

For example, Inatome said Visicalc for a long time held approximately 70% of the spreadsheet market, but recently dropped to a 59.8% share. And while its competitor, Lotus Development Corp.'s Lotus 1-2-3, only has 8.3% of the market, "it is clear we are seeing the emergence of something that might be considered a standard. Today there are more Lotus 1-2-3s being sold than Visicalcs."

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Make Fourth-Generation Language Easy to Use, Attendees Advised

By Paul Gillin
CW Staff

CW at Info

NEW YORK — Success in implementing an end-user computing environment using a fourth-generation language is contingent upon understanding the limitations of the language and upon writing the proper routines for users to extract and manipulate data, a consultant in fourth-generation languages said here last week.

Speaking to a session at the 10th International Information Management Exposition & Conference (Info '83), Hugh W. Ryan, a partner in the technical service organization at Arthur Andersen & Co. in Chicago, also stressed the need to make use of the language as easy as possible, even if it means initially sacrificing some security measures.

Ryan helped to implement Management Decision Systems, Inc.'s Express fourth-generation language at Northwest Industries, Inc., a Chicago holding company which boasts that 95% of its computing resources are devoted to end-user computing.

Ryan said it was possible to use a standard development model to install the fourth-generation system, but that some modifications were necessary.

Data Design First

The first involved switching the data design and system design functions so that data design was done first. "We found we can't ask the [system design] questions we've always asked because the user requirements change too quickly," Ryan noted. "The users may configure a system that then goes back and changes their requirements. Also, what the users want in one place may not be what they want in another."

Northwest found that the solution was contained in the fourth-generation languages, most of which "have internal data structuring assumptions that impose a data design. The implication for you is to know what that design is and work around it."

Some designs are inherently network-oriented while others are hierarchical, Ryan said. Thus, knowing what structure is used by that language can help the DP department make a better decision about whether a fourth-generation language is appropriate.

Designers ran into the same problems in designing a technical architecture. "The fourth-generation language imposes a technical architecture assumption on you," Ryan said. "The approach again is not to go around that assumption, but to conform to it."

Using Express, the designers found that the best approach was to set up a corporate data bank that was separate from the transactional data base. Data is extracted from the production tables at various machines on a regular basis using a data delivery system that includes translation tables, table maintenance, the data bank, data manager, support rou-

(Continued on Page 28)

CW Photo by L. Haber

"In the early stages, you don't want to be concerned with security. You just want to get the users using," Hugh W. Ryan of Arthur Andersen & Co. told an Info '83 audience.

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Tips Given on Fourth-Generation Language Use

(Continued from Page 27)

tines and a dialogue manager.

The data bank actually consists of a set of routines written to meet the needs of various users. "If you try to pull from the common data store, users will get bored very quickly," he said.

However, Ryan noted that the data delivery system is built in a third-generation language. "Fourth-generation languages don't easily handle these high-volume delivery systems," he said. "This creates a problem because if the user has to move across new data cells, it has to be done at third-generation language levels."

Validation and security should at first be handled in the data delivery mechanism of the new system, he advised. Although this may mean sacrificing some security features at first, "you don't want your users stepping through four commands just to get into the data base," he said. "In the early stages, you don't want to be concerned with security. You just want to get the users using."

Ryan stressed that systems design using a fourth-generation language should be accomplished with the help of an expert in the language being used. This can save time lost in needless design. "There are situations in which you don't need a valid design. You can just get down to the terminal and build the application."

The consultant is also a vital player during the implementation process, Ryan observed. He compared fourth-generation languages with early versions of IBM's IMS, in which bugs and system quirks were not always covered in reference materials. The expert can prevent the system from being shut down for hours while implementors scour the documentation for a solution to a problem, he said.

The last stage of the development cycle — testing — often has to be imposed upon the users, Ryan concluded. "Consistently users look at the data and say it's OK if it looks all right," he said. "That's not very acceptable to DP."

Testing procedures and measures have to be defined and endorsed by DP, although their value is not perceived by users.

Efta Elects Officers

WASHINGTON, D.C. — Mary-Pat Cottrell, vice-president of Citytrust in Bridgeport, Conn., will succeed Paul Hefner, vice-president of First Interstate Bancorp in Los Angeles, as chairman of the board of the Electronic Funds Transfer Association (Efta) here, the organization announced recently.

The association also announced the reelection of William R. Moroney as president and secretary and Timothy Dietz as treasurer. Dietz is a partner in the Washington, D.C., office of Price Waterhouse & Co., and Moroney is chief executive officer of Efta.

Albert A. Irato, executive director of the Matrix Financial Network in New York, was elected vice-chairman of the board.

Efta was founded in 1977 at the close of the two-year term of the congressionally mandated National Commission on Electronic Fund Transfers.

In 1981, the Electronic Money Council merged with Efta, forming what the association said is the only multi-industry electronic funds transfer organization in the country.

Efta also announced the election of six new members of the board of directors: Bruce Burchfield, president of Cirrus Systems of Oak Brook, Ill.; Stephen Cole, division head of electronic banking for First National Bank of Chicago; Joseph Denaro, vice-president for corporate credit for Zayre Corp. of Framingham, Mass.; John Farnsworth, senior vice-president of Chemical Bank in New York; Marilyn Gosz, director of financial systems for Fujitsu Systems of San Diego; and Robert Mooney, president of JC Penney Systems Services.

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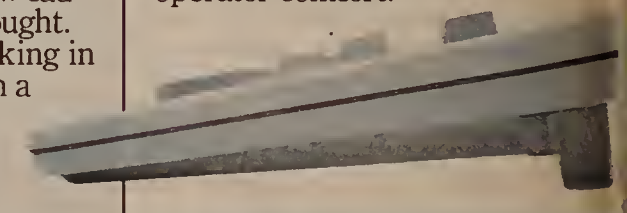

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Front-End Prototype Focuses on User

Speaker Outlines Applications Building Concept

By Paul Gillin
CW Staff

NEW YORK — Data processing departments have become expert at developing systems to specifications, but not at creating applications that impact the end user, Richard A. Carpenter, a vice-president at Index Systems, Inc., a consulting firm in Cambridge, Mass., said here last week.

The solution to that situation, according to Carpenter, lies in using an evolutionary development methodology that draws heavily on prototyping to build systems that meet user needs at the end — rather than at the beginning — of the development life cycle.

CW at Info

Speaking at a session at the Information Management Exposition & Conference (Info '83), Carpenter outlined an evolutionary methodology that includes a layered concept of building applications. The concept is based upon a realization that the information systems structure in most organizations is divided into three parts:

- The "back office" is the set of administrative and operation activities that monitor and translate real-world events into data form.
- The data base is the abstract of the real world that is relevant to the business.
- The front end is that data that is useful by any end user.

"Any information system requires close integration between these elements, both in flow forward from the back office to the data base to the front end and from the front end back about information that's in the data base," Carpenter said.

CW Photo by L. Haber

Richard A. Carpenter advocates an evolutionary development methodology that draws heavily on prototyping to build systems that meet user needs.

Current prototyping tools address a piece of the structure but not all of it, he said. Fourth-generation languages tend to focus on the front end, data management tools sit on the data base and teleprocessing monitors and screen facilities are in the back office. However, all the tools are moving in the direction of providing a more complete function, he noted.

"Conceptually, we want to build a front-end prototype that shows the user a window into that part of the data base and lets the user decide if that's what he wants," Carpenter said. After the prototype is constructed,

(Continued on Page 30)

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Transmission Mode	Conversation Mode	Conversation or Block Mode	Conversation or Block Mode
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Visual Attributes: Reduced Intensity, Blink Blank and Reverse Video. Underline also on ADM 12 and ADM 24E	3 Embedded 1 Non-Embedded	5 Embedded or Non-Embedded, plus Full Screen Reverse Video	6 Embedded or Non-Embedded, plus Full Screen Reverse Video and Highlight
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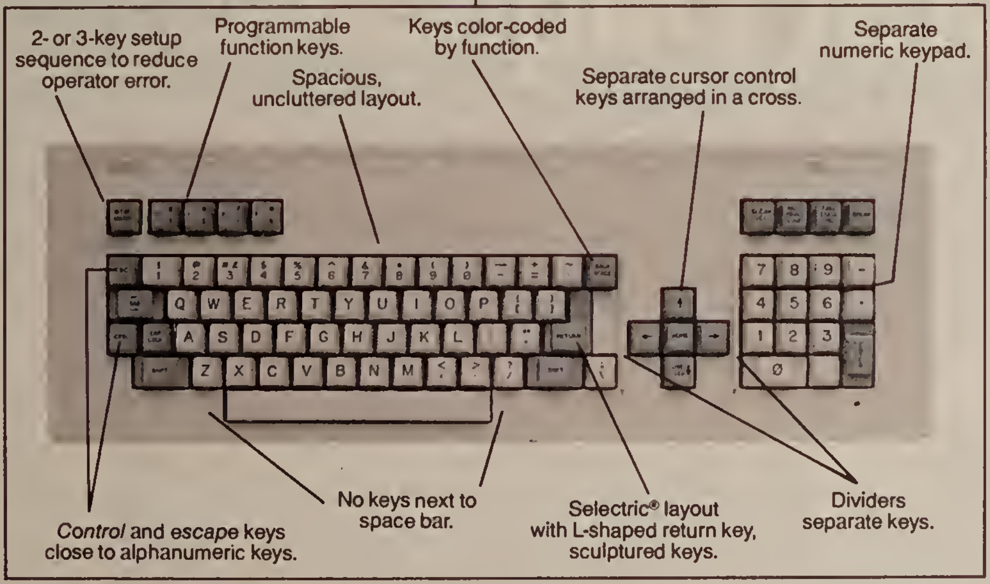
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Front-End Prototype Stresses User's Needs

(Continued from Page 29)

the analyst/builder creates the system nucleus, which is the operational back-office material that populates and supports the front-end prototype. System evolution involves repeating this task several times to layer the system to meet the user's expectations.

Carpenter stressed that prototyping should be thought of as one tool in the development methodology arsenal and not as a methodology in itself. "The front-end prototype is data obtained by extracts," he said. "It's operationally useful, low cost and quick."

The final application ideally should be data base-centered, segmented into the three parts of the information systems structure, integrated and evolutionary, he said. To achieve this, a standard systems architecture should be defined for the information systems structure as a whole.

"If the group can agree on a standard architecture, a great deal of value can come from that by avoiding reinventing the wheel every time a new system comes along," he said.

The architecture can include such factors as specifications for data base access, dialogue management and data validation.

The DP shop next needs to agree on the application environment, including hardware, operating system, data base, fourth-generation languages and tools and facilities that are available, he said. "In most organizations, there's a collection of tools and utilities that provide overlapping islands and some gaps," he said. "A lot of time is spent figuring out what we are and aren't going to use."

Defining the application environment allows the analyst/builder to focus on the front-end prototype rather than the tools, he said.

The third area an information systems organization needs to define is the application development methodology, or the "how to" of design strategies. The most important segment of this is problem formulation, which should answer five critical questions: What is important about the problem to be solved? What is the system scope that is needed to answer the problem? What are the key segments? How does one proceed? What are the major obstacles to success?

To answer the last question, the developer and user need to identify key technical and responsibility issues. The goal is to identify everything that could possibly go wrong with the system and prepare a response to each one, Carpenter said.

The remaining stages of the development methodology should follow a similar approach of building a prototype and system nucleus with each stage scheduled to take a maximum of six to 12 weeks.

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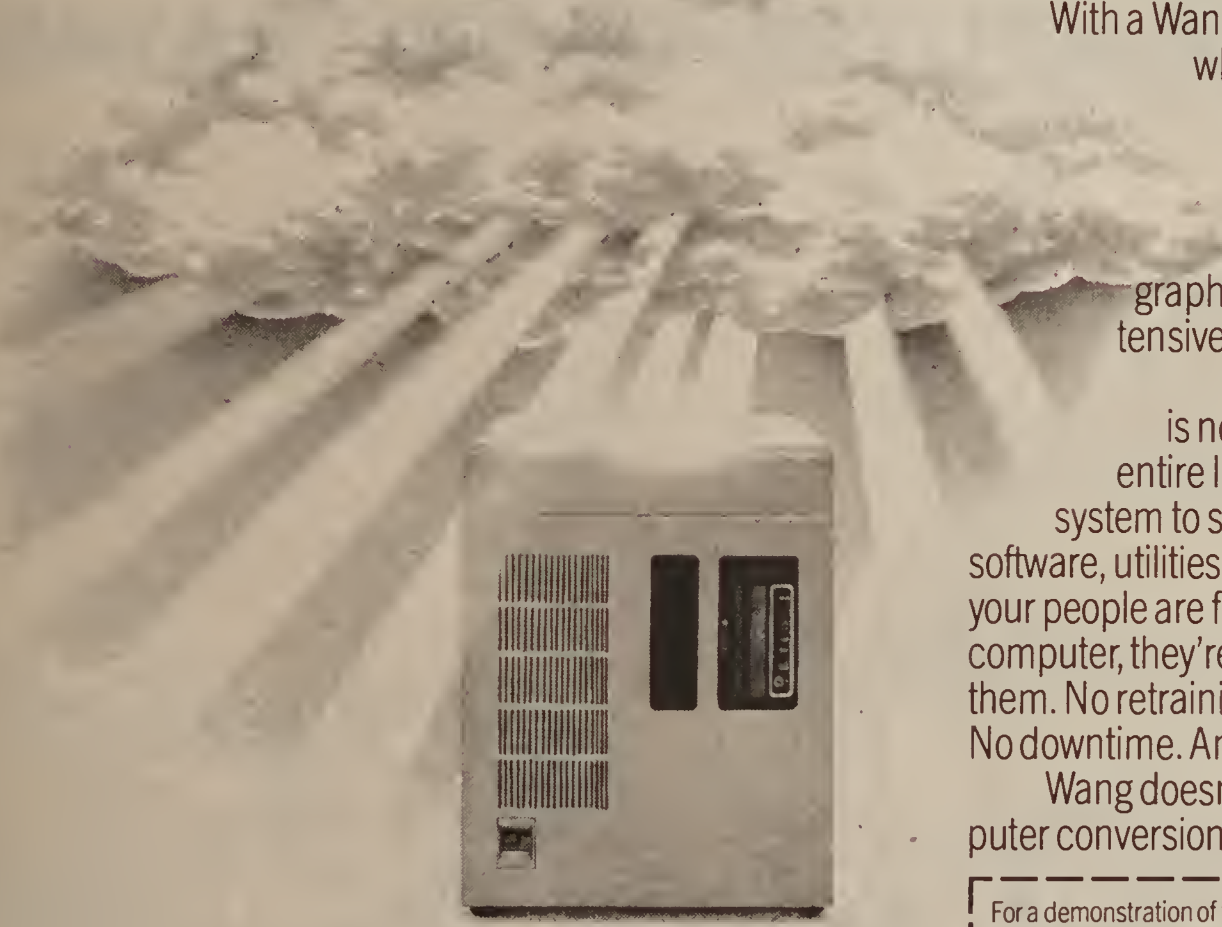

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DP Managers Say DSS Needed To Tie Together Corporate Micros

By David Myers
CW New York Bureau

CW at Info

NEW YORK — Talk of decision support systems (DSS) dominated last week's 10th International Information Management Exposition & Conference (Info '83) here. As personal computers sprout up throughout corporate organizations, the need to string them together by means of DSS takes on more and more importance, data processing managers told their fellows at two Monday sessions in the New York Coliseum.

"The whole personal computer environment is one we have to deal with effectively — and we have to understand it," Joseph E. Armstrong, director of information processing at the Mars Corp., explained.

The proliferation of personal computers will create dozens of "independent systems" within a corporation, according to Richard P. Bonzagni, director of marketing at Management Decision Systems, Inc. Bonzagni said individual computer users within an organization will almost "be going off and starting new departments."

Pulling them together into an integrated system will be the challenge facing the corporate DP manager, Bonzagni said.

Forbade Micro Buying

One large U.S. oil company forbade its department heads to buy personal computers for that very reason. Amerada Hess Corp., whose DSS has been up and running for nearly a year and a half, is "just now letting [personal computers] show up in a very controlled way," said John Gannon, Hess' director of management information systems. "Frankly, we wouldn't let them proliferate throughout our company because we were afraid of losing control."

Corporate DP managers must control access to the company's DSS, too, Armstrong warned. "On-line data base access is what everyone wants, whether he needs it or not," according to Armstrong.

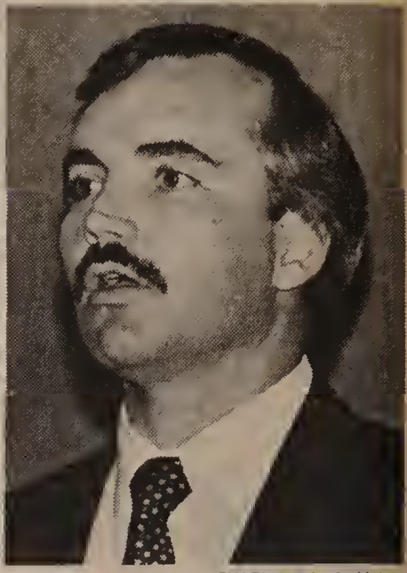
James T. Beattie, manager of marketing and sales systems for Savin Corp., believes four points need to be kept in mind by anyone devising a DSS for a company:

- DSS is an "evolutionary process. Your goals will have to be moving targets," Beattie said. However, he cautioned DP managers to try to come up with a system that will recoup its cost within three years.
- The success of the DSS must be measured by the impact of management decisions made with its help, Beattie said.
- DSS is "no easy trip." Those who install one must be ready for a raft of problems.
- The system must be fully planned out to be successful. "If you try to react to DSS, you'll find yourself with a lot of different microcomputers floating around your company," Beattie said.

Savin's own decision support arrangement has been christened Stars, for Sales Tracking and Reporting Sys-

(Continued on Page 34)

Joseph E. Armstrong



CW Photos by L. Haber

James T. Beattie

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Position in Mart Called Key to Business Strategy

By Ed Scannell
CW Staff

CW at Info

NEW YORK — Formulating a proper business strategy depends not only on a company's internal cost and resource utilization factors, but also on the position and quality of its products in the marketplace relative to its competition's.

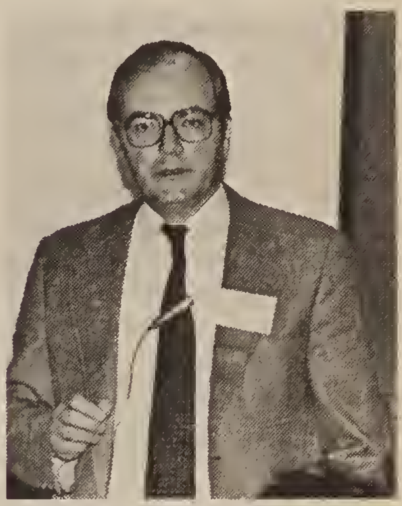
This contention was made by three speakers representing the Cambridge, Mass.-based Strategic Planning Institute (SPI) at a session titled "Using Information Technology to Improve Strategic Business Management." The session was held here last week as part of the 10th International Information Management Exposition & Conference (Info '83).

The three SPI speakers — Augustus van Nievelt, director; Bradley Gale, director of research; and Joaquim Branco, manager of application software development — emphasized that all too often companies base their business strategies on information that is oriented toward accounting convention, the income statement and the balance sheet.

"It's important to know how you stack up against the competition," Gale asserted, "but you won't find out through the balance sheet. Product quality, market share and productivity as compared to the competition is what determines your chances for success."

Gale said there are three important concepts involved in collecting information in these three areas for use in formulating a business strategy: the strategic business unit (SBU), the served market and the competitors.

Gale defined an SBU as a distinct set of products or services that serves a specific group of customers and competes against a well-defined set of competitors.



CW Photo by L. Haber

"It's important to know how you stack up against the competition, but you won't find out through the balance sheet," Bradley Gale told attendees at Info '83.

When focusing on SBUs, Gale underlined, the most important thing for managers to know is how the competition is affecting the SBU's financial performance.

A served market, according to Gale, is a niche within the total market.

Companies can best serve their niche markets first by offering a suitable product for their segment and, second, by making the kind of marketing effort that ensures their products will reach that segment, he said.

In light of the major advances made in information technology over the past few years, managers today can more easily obtain and apply information concerning the quality and market position of their competitors' products, Gale said.

He cited his firm's Profit Impact of Market Strategy (Pims) program as one example of how managers can more easily obtain and apply this kind of strategic information.

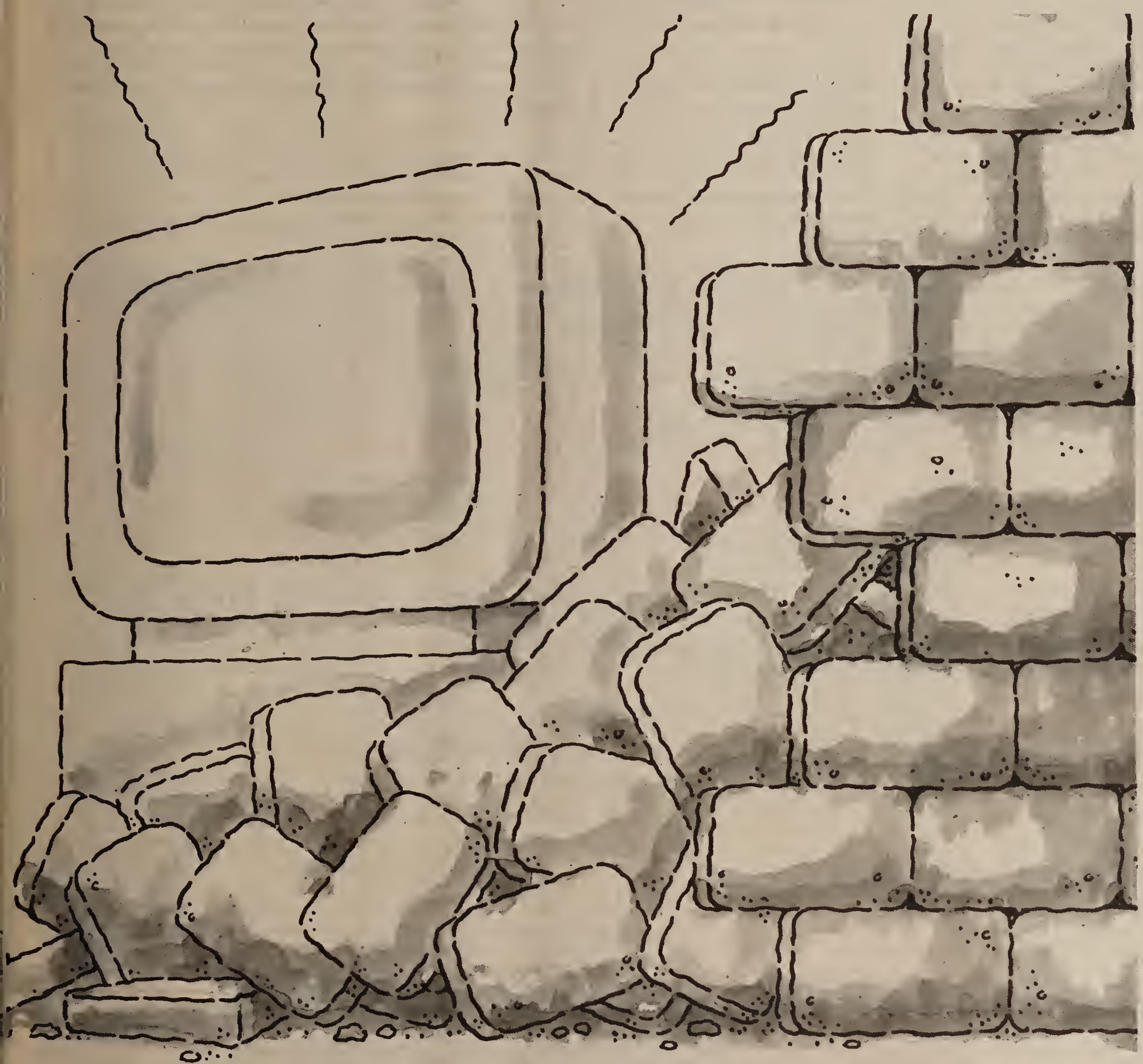
The Pims program is a data base that provides a base of information for its member companies developing or improving a business plan.

Each member company contributes information in a coded format about its own business experience to the data base.

The SPI staff then analyzes this information to discover general "laws" that determine what business strategy, in what kind of competitive environment, produces what kind of performance, according to Gale.

To date, several hundred member corporations have

(Continued on Page 34)



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Overcoming Human Obstacles Seen Key to Implementing OA Strategy

By Katherine Hafner
CW Staff

CW at Info

NEW YORK — Implementing office automation strategies is often a matter of overcoming human obstacles.

This is the opinion of Dr. Michael Zisman, president of Integrated Technologies, Inc. in King of Prussia, Pa. Addressing an audience here last week at the Information Management Exposition & Conference (Info '83), Zisman said that OA is an evolving definition, an elusive goal — and, he maintained, the office of the future will always be just that.

Strictly speaking, Zisman said, OA is the utilization of computer-based systems to enhance the effectiveness and productivity of personnel working in the office. "But whatever you call it, we all need to reconcile ourselves to the fact that it's all OA — delivering computer capability to the end user."

"To suggest that OA isn't happening is rubbish," Zisman asserted. "We're installing systems at a rate no one would have thought of years ago."

Nevertheless, the obstacles to the implementation of integrated office systems in a multivendor setting are manifold, and they affect vendors, implementors and end users alike, Zisman warned. "The challenge now is to move toward the integrated office system, either within or across vendors."

And as vendors keep coming out with products, it's harder and harder to create and maintain compatibility, he added. Moreover, vendors suffer from being unsure of user requirements, while "crying out to understand what people need."

CW Photos by L. Haber

Michael Zisman

A combination of poor human communication and "oversell" work to foster a lack of understanding. As a possible remedy, Zisman suggested asking specific questions of the vendor. But "the onus is on you to be extremely precise," Zisman reminded his audience.

Finally, Zisman suggested, specific strategies should be developed for planning, technology integration and control.

'The Party Is Over,' Consultant Says of OA

By Katherine Hafner
CW Staff

NEW YORK — Does office automation have a future?

Ask that question of Michael Hammer, president of Hammer & Co., Inc. in Cambridge, Mass., and his answer will be brutally frank: "Let's face it. The party is over. Reality is setting in."

Such was Hammer's diagnosis of the state of office automation when he addressed attendees of the Information Management Exposition & Conference (Info '83) here last week.

"On the whole, we have to rethink our basic assumptions," Hammer asserted. Eschewing cost/benefit analyses for justifying office automation systems, Hammer suggested the focus shift instead to functionality.

"What managers and professionals should really do is think about the systems and how to use them. Multifunctional workstations in themselves are no good," Hammer said. "What you need is informational tools such as spreadsheets and financial modeling and data base tools."

The path to the office of the future is, in Hammer's view, an incremental one. "The reason personal computers are so successful is that you can buy them one piece at a time," he maintained.

According to Hammer, the "healthy people don't get OA because it's the thing to do, but because they have a problem they need solved. Leaders in office automation are not Fortune 500 organizations, but smaller companies which are big paper pushers, like law and governmental organizations."

Where is OA heading?

"We're not looking at administrative but business support of office automation. What we're really interested in is what OA will do for our business," Hammer said.

Hammer sees office automation as an investment — and not necessarily a cost-effective one. The rewards of office automation will eventually be seen in increased revenue from improved customer service and better resource utilization, he said. r said.

DSS Targeted at Info '83

(Continued from Page 32)

tem. The unique setup measures salesmen's accomplishments not in terms of how many Savin copiers they must sell in a year or of how many dollars they must bring in, but rather in terms of how many "activities" — customer contacts, follow-ups, product demonstrations — it takes to clinch a sale.

"By starting with his [a sales representative's] productivity goals, you can back into the number of activities he has to perform in order to reach them," Beattie told attendees at the conference.

To do this, Savin hooked up personal computers in each of its sales branches, "putting control of the system in local hands," Beattie explained.

Although Savin's experience is thus the polar opposite of Amerada Hess', both companies decided to go with Comshare, Inc.'s System W in setting up their decision support systems.

Business Strategy Discussed

(Continued from Page 33)

contributed about 200 variables covering close to 2,500 businesses.

According to Gale, Pims allows companies to establish profitability benchmarks so they can "reality-test" their business plans and to delineate tactics successfully used by the data base's look-alike companies trying to achieve similar goals.

Joaquim Branco

Giving testimony to the value of Pims and other data bases like it in formulating business strategies, Robert Saslaw, director of planning for TRW, Inc., said he sees Pims as a "mythical consultant that is objective and has a perfect memory."

Saslaw said he has used Pims in applications involving competitive analysis, plan verification, residual-value calculations, acquisitions analysis and portfolio analysis.

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Contel Chief Outlines Growth Of DP, Telecommunications

By Katherine Hafner
CW Staff

CW at Info

NEW YORK — If Howard Frank's "information map" were superimposed on a map of the U.S., the computer would end up smack in the middle, somewhere in the vicinity of Missouri.

Addressing attendees of the 10 International Information Management Show & Exposition (Info '83) here last week, the president of Great Neck, N.Y.-based Contel Information Systems, Inc. said that even "the early computer landscape" had the computer in the center of the picture.

Frank divided the information map into four quadrants, ranging from conduits to contents on one axis and from products to services on another. A book, for example, represents content, and the paper on which it is printed represents a conduit. The U.S. Postal Service is strictly a conduit-oriented service, while professional services are content-oriented.

The computer, he said, encompasses all of these elements.

Sketching the evolution of telecommunications, Frank cited the gradual overlap of content- and conduit-oriented products and services. As technology has brought about the merger of computing and communicating in the 1970s, "we began to discover networks and computers could work together, and we began to attach locally smart processors and terminals to networks."

Today's telecommunications networks are part of an entire distributed data processing system, Frank said, with local intelligence at the terminal, the controller, the periphery of the network, the front-end processor and the host.

"We're continuing to move into a world where intelligence is inevitable," Frank said. "If today's networks are smart, tomorrow they'll be even smarter."

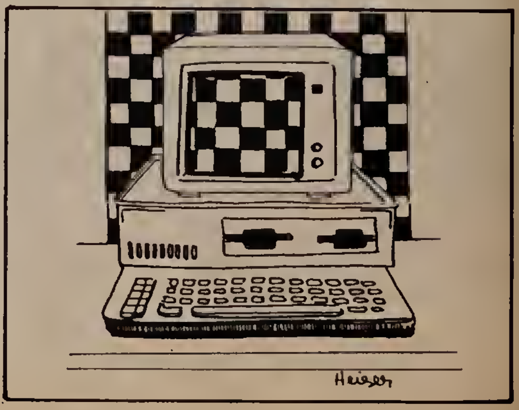
Even the location of intelligence is an issue of economics, Frank said. "The issue of where to put it has become more an issue of economics than capability. Expensive implies centralized and cheap implies distributed."

"Today the network and the computer are inseparable," Frank asserted. "A pattern has been established that has moved the world's largest corporations."

"In 1990, communications networks as we know them today will look like old hat," Frank continued. "Communications, data processing and office automation are going to converge as information management in 1990."

In his prognosis, Frank pointed to "a very interesting confrontation between a deregulated AT&T and IBM," with IBM's acquisition of 15% of Rolm Corp. and AT&T's diversification.

Frank pointed to others, such as Xerox Corp. and NCR Corp., who have managed to close the gap between computers and other, less central offerings. "With products like Ethernet, Xerox has bridged the gap between being a copying company and a true computer company," he observed.



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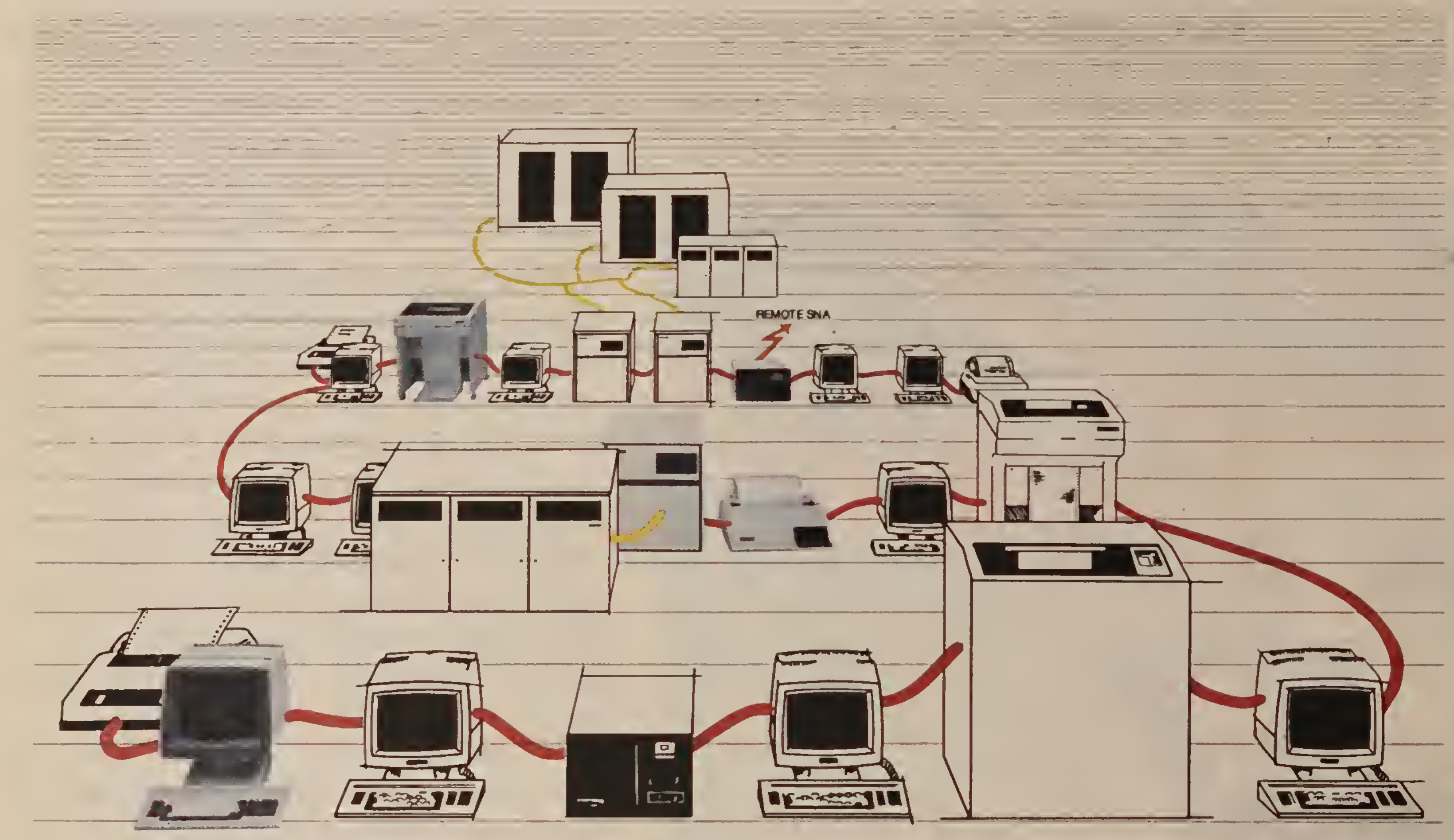

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HOUSTON — Debtors beware! One of the largest collection agencies in the country is better able to service its clients now with the help of a data compression system that allows the company to squeeze more information into its mainframe data base.

Founded in 1957, GC Services Corp. here serves client companies through a nationwide network of 36 collection centers. Based on the number of accounts handled, the amount of money collected and the firm's high recovery percentage, GC Services is reportedly one of the largest collection agencies in the U.S. today.

That success, according to Daniel Parfimowicz, assistant director of data processing, is due in large part to the sophisticated DP and computer systems the company has had in place since 1968.

The firm employs an IBM 4341 Model Group 2 CPU with IBM 3370 and 3375 hard disk drives and uses the DOS/VSE operating system under VM utilizing Cobol and assembly language with CICS, Vsam and DL/1 data bases.

The system handles an average of 20,000 transactions daily, according to Parfimowicz. Through dumb terminals and modems, debt collectors in the remote collection centers can access any file on the mainframe for inquiry.

But, Parfimowicz said, the problem his DP facility faced was a shortage of disk storage space. The company has two master files — a mail effort file and a telephone effort file — which are used as collection tools. The files maintain information on active debtors, including the name and address of each debtor in addition to the debtor's payment history and a continuing record of collection activity.

However, the lack of disk storage prevented the firm from storing both master files on the system. "Only our telephone effort file was on disk. Our mail file was on tape and had become too time-consuming to access. Because this was a list of active debtors, it was desirable to put the mail-effort data on-line so that we could handle client inquiries better," Parfimowicz said.

Believing that account records could be more readily accessed on-line, GC Services decided to transfer the information on mail efforts from tape to disk. That decision posed a problem, though.

"The tape file was large, consisting of records for more than four million accounts. When we attempted to put the data on-line we found that we were unable to transfer the entire file because the telephone effort file had taken up so much direct-access storage device space," Parfimowicz explained.

Convinced that account records could be more easily accessed on-line, the company decided to investigate the options available for obtaining more disk space. Parfimowicz settled on Informatics General Corp.'s Shrink file compression system. "We chose Shrink to compress our telephone efforts file," Parfimowicz said. "By utilizing this software system we were able to cut the space needed by the existing data in half, making it possible for us to create an on-line mail effort file."

That decision has resulted in more than just increased disk storage. "We've upgraded the service we provide to our clients substantially since implementing the file compression system," Parfimowicz explained. "With the additional disk space created, we've been able to put all the files we need on-line. Now client inquiries are handled in five to 10 minutes. That's a real savings compared to the average two to five days it took to pull the same information from microfiche files before."

The Shrink system also resulted in cost savings. "We didn't have to buy any disks, and that was a real savings. By putting the data on-line we were also able to forego the tedious task of searching microfiche files. That reduced the staff required to handle customer inquiries. At a cost of $500 a month, I feel Shrink has paid for itself."

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Bank Cuts Costs With Switch From Data Entry to On-Line

TRUMBULL, Conn. — After eliminating a time-consuming, multistep data entry method and replacing it with an on-line system, a bank here is providing better service for its more than 600,000 customers.

The Union Trust Bank data center is responsible for processing daily transactions originating at eight remote departments in New Haven, Norwalk and Stamford, Conn. In the past, according to Judy Bridgeman, manager of data entry, the keypunch system required that source documents be sent to the data center for keying to cards or diskette before being transferred to tape and input to the IBM 4341 mainframe.

In addition to departmental needs, the data center processes the daily transactions of the bank's 59 branch offices. Hiring additional keypunch operators and leasing additional equipment seemed unavoidable in light of a projected increase in the data processing work load. Leasing costs were already in excess of $36,000 a year, and larger jobs such as payroll were sent to a contract data entry firm for processing at an additional cost of more than $12,000 yearly.

According to Bridgeman, the only solution was to move to an on-line system. That system was implemented in early 1980 and has been successful in keeping costs in line, assisting in the growth of the bank's business development and providing remote locations with independent end users.

With TSI International, Inc.'s Key/Master package, data entry is now in the hands of individual departments, each of which is able to enter data directly from its location. Thus, production costs have been maintained because increases in equipment and personnel were unnecessary and leasing costs have been cut in half.

Through the on-line system, independent end users in each department now have access to the reports they need when they need them. More importantly, the data entry staff is able to concentrate solely on processing the bank's daily transactions.

An added bonus is that the potential for lost documentation and for security breaches has been eliminated. Because data is no longer transferred between departments and locations for processing, security has improved. And, with independent end users in control of and responsible for their own data, errors can be detected and corrected by those most familiar with that data.

Key/Master is used by the bank for more than 60 applications, including installment loans, savings accounts and personnel. Union Trust has implemented some applications of its own, such as an Individual Retirement Account reporting system and various financial control operations.

Bridgeman said the Key/Master system has relieved the "heads-down" monotony of data entry and, in addition to eliminating punched-card-related problems, the system's screen formats have given operators a new understanding of the banking functions they accommodate. Along with Key/Master's verification routines, that new interest has led to improved operator productivity and data accuracy.

Ultimately, though, it is the bank's customers who have benefited most. Because remote departments are responsible for their own data entry, the data center staff can concentrate on processing new accounts every night. "If you open a bank account today, you want to use your money tomorrow," Bridgeman said. "Key/Master has enabled us to provide our customers with more timely information and services."

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Seminar Schedule

State	City	Date	State	City	Date
California	San Diego	November 2	Rhode Island	Providence	November 10
California	San Jose	November 9	South Carolina	Columbia	October 26
Florida	Jacksonville	November 1	Texas	San Antonio	October 26
Maryland	Baltimore	October 25	Virginia	Richmond	November 15
Massachusetts	Boston	November 9	Wisconsin	Madison	October 20
Massachusetts	Worcester	November 22	Wisconsin	Milwaukee	October 25
New Mexico	Albuquerque	November 2			
New York	Garden City	November 1	Canada	Edmonton, Alberta	October 27
North Carolina	Raleigh	November 9	Puerto Rico	San Juan	November 3
Pennsylvania	Philadelphia	November 3			

Vendors Pledge $18.5 Million

Berkeley CAD Center Rescued

By John Gallant
CW Staff

BERKELEY, Calif. — Threatened by cramped facilities and state funding that withered on the vine, the University of California at Berkeley's computer-aided design center — renowned for its research in the field of integrated circuit chip design — has been saved by an $18.5 million gift pledged by a consortium of high-technology firms.

The consortium, which includes IBM, Hewlett-Packard Co. and Digital Equipment Corp., rescued the center with donations of $10 million in computer equipment and an $8.5 million construction grant for a new design and manufacturing facility that is expected to open by late 1984, according to Prof. Alberto Sangiovanni Vincentelli, vice-chairman of the Department of Electrical Engineering and Computer Science.

According to Vincentelli, HP has already agreed to donate approximately $3 million in equipment that includes HP 9000 and HP 9836 workstations. In addition, Tektronix, Inc. plans to donate an unspecified number of its Magnolia workstations.

Vincentelli also said that IBM is considering a "multimillion-dollar donation" and DEC is studying a grant of "$4 million to $5 million in equipment, including a few VAXs and a number of VAX-11/730 workstations." He said DEC has scheduled an announcement for some time in November. According to Donald Pederson, chairman of the department at Berkeley, IBM will make a decision on equipment donation within the next year.

The school currently operates three VAX-11/780 superminicomputers and one VAX-11/750 supermini in addition to an HP 3000 system and individual workstations manufactured by a variety of firms.

The $8.5 million building grant will be used to add a new level to the four-story structure that houses the present research facilities. To be known as the CAD/CAM (computer-aided design and manufacturing) Consortium, the new center will be devoted entirely to research in computer-aided design.

"With this new facility, we can expand our program in CAD/CAM and do more advanced research," Vincentelli said. "This will give us a tremendous opportunity to grow and to attract qualified students."

Vincentelli, who is also admissions director for the program, said there are currently 90 to 100 graduate students attending the center, which has a staff of four full-time and 15 part-time faculty. With the expanded facilities, he expects the program to accommodate 200 students.

Along with Carnegie-Mellon University in Pittsburgh, Pa., Berkeley has been recognized by the Semiconductor Research Corp. (SRC) as one of two "centers of excellence" in the U.S. for its use of computers in designing integrated circuits. The SRC, a nonprofit subsidiary of the Semiconductor Industry Association, is a cooperative research financing organization formed in early 1982 by 13 major U.S. electronics firms.

Because most of the 15 companies that make up the consortium which has pledged aid to the Berkeley center are also members of the SRC, Vincentelli said, they have contributed twice to advanced research at Berkeley. In November 1982, the SRC contributed $1.75 million to Berkeley and Carnegie-Mellon for research in computer-aided design of integrated circuits [CW, Nov. 29, 1982].

The 15 members of the consortium are IBM; Advanced Micro Devices, Inc.; Bell Laboratories; DEC; General Electric Co.; Harris Corp.; HP; Hughes Aircraft Co.; Intel Corp.; National Semiconductor Corp.; Schlumberger Foundation; SRC; Tektronix, Inc.; Texas Instruments, Inc.; and Xerox Corp.

Vincentelli said that under the arrangement worked out with the consortium — each member industry will be allowed to maintain one full-time adviser to work with students and faculty at the CAD/CAM design center — both Berkeley and the companies will benefit.

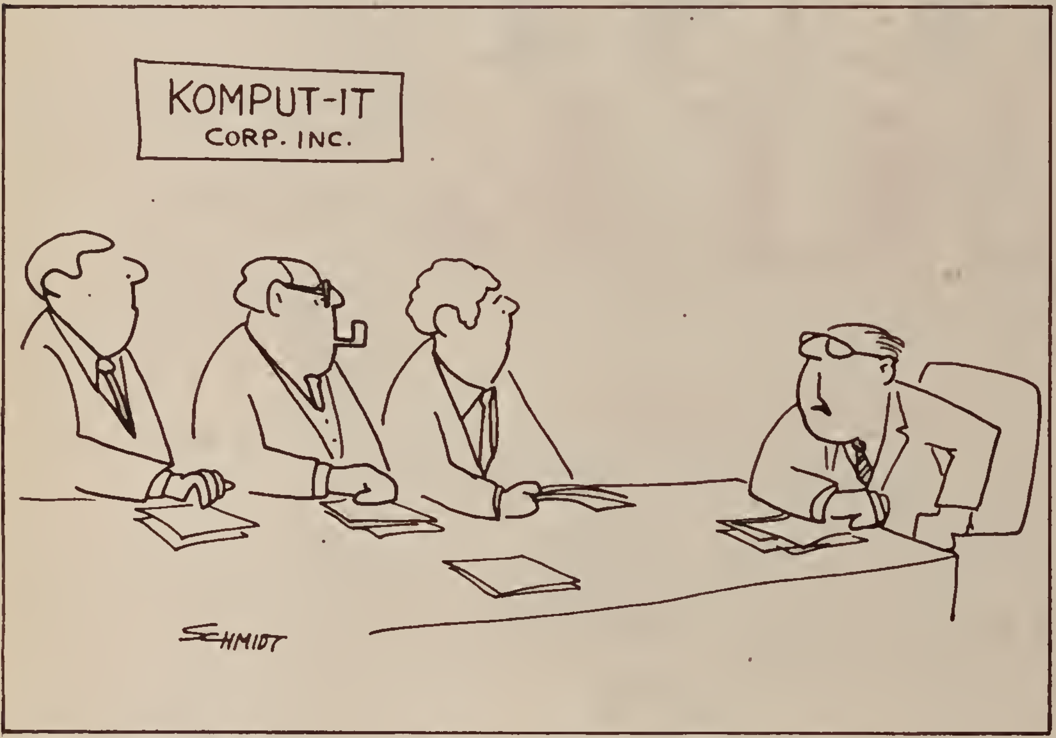
"They will have direct access to all of our research work. From their viewpoint, Berkeley is the best center for computer-aided design. So, they will have access to the most advanced research being done in this field. For our benefit, these firms will give us real-life situations to work within and real-life problems to solve," Vincentelli said.

The university will retain all rights to products developed at the center, but the participating firms will be free to incorporate the technology for industrial use.

The center's faculty began the search for new funding two years ago when cramped facilities threatened the school's preeminence in computer-aided research. "We simply couldn't fit in our department anymore. We couldn't accommodate any new equipment due to our lack of space," he said.

The faculty first approached officials of the University of California system, who approved the center's expansion plans and set aside development funds. But when the state's fiscal crisis delayed that funding indefinitely, supporters formed a committee to petition industry for aid.

Chaired by Dr. C. Lester Hogan of Palo Alto, Calif.-based Fairchild Camera and Instrument Corp., the committee's entreaties were answered by the consortium.



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Calendar

Week of Oct. 30

Nov. 1, New York — **CICS/VS Concepts and Facilities.** Contact: Teltech, 39 Broadway, New York, N.Y. 10006.

Nov. 1, Dallas — **The D/FW Users Group Vendor Fair.** Contact: Nancy Gilley, The Ryan Co., 505 Ryan Plaza Drive, Arlington, Texas 76011.

Nov. 1-3, Washington, D.C. — **Local-Area Networks: Concepts, Technology and Products.** Contact: Technology Concepts, Inc., 730 Boston Post Road, Sudbury, Mass. 01776. Also being held Nov. 8-10 in San Francisco and Nov. 15-17 in Boston.

Nov. 1-3, San Francisco — **Debugging for Application Programmers.** Contact: Southern Training Corp., Suite 1030, SCN Center, Columbia, S.C. 29201.

Nov. 1-3, Washington, D.C. — **Data Communications: Network Design and Optimization.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 1-3, Washington, D.C. — **Federal Office Automation Conference.** Contact: Federal Office Automation Conference Housing Bureau, Suite 250, 1575 Eye St. N.W., Washington, D.C. 20005.

Nov. 1-4, Los Angeles — **Data Base Management Systems – Mini, Micro and Distributed Application.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Nov. 1-4, Minneapolis — **Data Communications: Components, Systems and Networks.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 1-4, Palo Alto, Calif. — **Defining Software Requirements, Specifications and Tests.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Nov. 29-Dec. 2 in Boston.

Nov. 1-4, Lincoln, Neb. — **Structured Requirements Definition.** Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604. Also being held Nov. 15-18 in San Antonio, Texas, and Nov. 28-Dec. 2 in Atlanta.

Nov. 1-4, Baltimore — **Practical Structured Techniques for Software Design and Coding.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Nov. 15-18 in Palo Alto, Calif.

Nov. 1-4, Washington, D.C. — **Software Project Management.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Nov. 15-18 in Los Angeles and Nov. 29-Dec. 2 in Boston.

Nov. 1-4, Boston — **Hands-On Pascal Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045.

Nov. 2-4, Chicago — **Automated Application Design: Product Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 2-4, Atlanta — **Component Three.** Contact: Rita Louderback, 2900 Chamblee-Tucker Road, Building 16, Atlanta, Ga. 30341.

Nov. 2-4, Chicago — **SNA and Today's Telecommunications Environments.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Nov. 16-18 in New Brunswick, N.J.

Nov. 2-4, San Diego — **Micro and Personal Computers: Technology and Application.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 2-4, Andover, Mass. — **Imaging Industries.** Contact: Institute for Graphics Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Nov. 2-4, Monterey, Calif. — **The Fifth Symposium on Automation Technology in Engineering Data Handling and CAD/CAM.** Contact: Donna Davidson, Automation Technology Institute, Inc., P.O. Box 242, Pebble Beach, Calif. 93953.

Nov. 2-4, Arlington, Va. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 2-4, New York — **Evaluating, Selecting and Using Computer Software Packages.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 2-4, Los Angeles — **Lamond on IBM.** Contact: Cap Gemini Sogeti/USA Group, 9045 N. Deerwood Drive, P.O. Box 23767, Milwaukee, Wis. 53223. Also being held Nov. 8-10 in New York.

Nov. 2-4, Dallas — **SAS Computer Performance Evaluation Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 2-4, San Francisco — **The Personal Computer: Strategies for Managing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Nov. 9-11 in New York and Nov. 28-30 in Philadelphia.

Nov. 2-4, Monterey, Calif. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Nov. 2-4, Chicago — **Fundamentals of Data Processing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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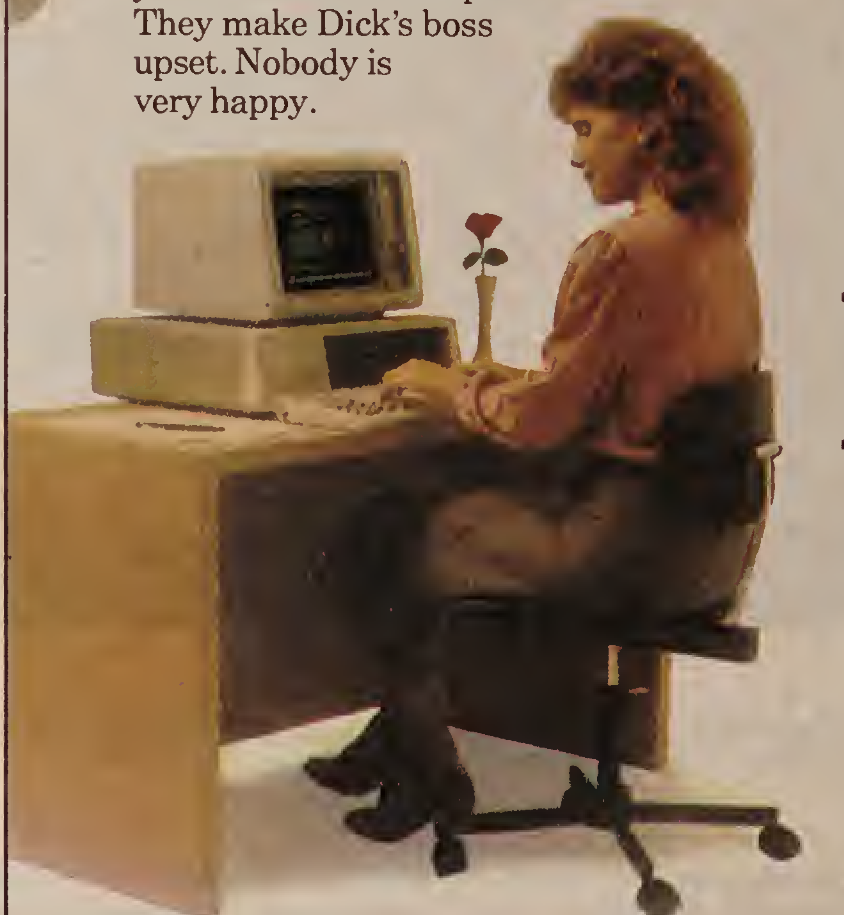

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Nov. 3-4, New York — **Datapro Update: Data Communications Today.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 3-4, Cleveland — **Applying the New Tools for Profit and Cash Flow Planning: Graphics and Personal Computers.** Contact: Matthew Malok, The American Institute of Certified Public Accountants, 1211 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 7-8 in Wichita, Kan., Nov. 22-23 in Philadelphia and Nov. 29-30 in Chicago.

Nov. 3-4, San Francisco — **IBM Systems Network Architecture: A Master Plan for Teleprocessing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 3-4, Andover, Mass. — **Computer Operations Management.** Contact: University of Lowell, Continuing Education, One University Ave., Lowell, Mass. 01854.

Nov. 3-4, San Francisco — **Local-Area Networks: Equipment and Systems.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424. Also being held Nov. 8-9 in Washington, D.C., and Nov. 10-11 in Phoenix.

Nov. 3-4, San Francisco — **Writing Skills for the DP Professional.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Nov. 17-18 in Orlando, Fla., and Nov. 28-29 in Boston.

Nov. 3-4, Newport Beach, Calif. — **Office Automation: The Hardware, the Software, the Systems.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Nov. 17-18 in Boston.

Nov. 3-4, Boston — **Digital Private Automatic Branch Exchange.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Nov. 14-15 in San Diego and Nov. 17-18 in Dallas.

Nov. 3-5, New York — **Computer Law Institute.** Contact: The Registrar, Practicing Law Institute, 810 Seventh Ave., New York, N.Y. 10019.

Nov. 3-6, Worcester, Mass. — **The New England Computer Show and Sale.** Contact: Chevalier Associates, Inc., 297 Turnpike Road, Westborough, Mass. 01581.

Nov. 4, Dayton, Ohio — **Personal Computers in the Business Environment.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Nov. 4 in South Bend, Ind.; Nov. 28 in Vancouver, B.C.; Nov. 29 in Seattle; and Nov. 30 in Spokane, Wash.

Nov. 5-6, San Diego — **The Fourth Annual San Diego Computer Fair.** Contact: San Diego Computer Society, P.O. Box 81577, San Diego, Calif. 92138.

Week of Nov. 6

Nov. 6-8, Andover, Mass. — **Three-Dimensional Imaging Techniques.** Contact: The Institute for Graphics Communications, 375 Commonwealth Ave., Boston, Mass. 02115.

Nov. 6-9, Athens, Ga. — **Improving Productivity Through Electronic Technology.** Contact: Nancy Italia, Italia and Co. (PSI International Symposium), Suite 350, 2700 Cumberland Pkwy., Atlanta, Ga. 30339.

Nov. 7, Boston — **IMS Concepts and Facilities.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7, Washington, D.C. — **State-of-the-Art Microcomputers.** Contact: Associated Information Managers, Suite 470S, 1776 E. Jefferson St., Rockville, Md. 20852.

Nov. 7-8, Baltimore — **Dbase II.** Contact: The Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Nov. 9-10 in San Diego.

Nov. 7-8, New York — **Beyond System/34.** Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

Nov. 7-8, New York — **Office Systems and the Role of the Personal Computer.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

Nov. 7-8, San Francisco — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-8, Los Angeles — **Advanced Office Automation for the 1980s.** Contact: Software Institute of America, 339 Salem St., Wakefield, Mass. 01880. Also being held Nov. 14-15 in New York.

Nov. 7-8, New York — **System/34 Migration: Is It All Down Hill From Here?** Contact: Techtran, 72 Cummings Road, P.O. Box 10212, Stamford, Conn.06904. Also being held Nov. 17-18 in Chicago.

Nov. 7-8, Los Angeles — **Advanced Configuration Management.** Contact: The Technical Marketing Society of America, Seminars, Dept. ACM, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held Nov. 14-15 in Palo Alto, Calif., and Nov. 17-18 in Newport Beach, Calif.

(Continued on Page 46)

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Calendar

(Continued from Page 45)

Nov. 7-8, Chicago — **Personal Computers: Programming in Basic.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-8, Dallas — **Quality Assessment of Analysis and Design.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7-9, Denver — **Data Communications: An Introduction to Concepts and Systems.** Contact: Datpro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-9, Washington, D.C. — **Micro and Personal Computers: Technology and Applications.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 7-9, Washington, D.C. — **Office Automation for Increased Management Productivity.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 7-9, Dallas — **DP Disaster Recovery Seminar.** Contact: EDP Security, Inc., 181 West St., Waltham, Mass. 02154.

Nov. 7-9, Boston — **Systems Analysis and Design: Concepts and Effective Practices.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-9, Chicago — **Structured Testing.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 7-9, San Francisco — **Automated Applications Design: Product Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-9, Boston — **Structured Analysis for Users.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 7-9 in Houston.

Nov. 7-9, Washington, D.C. — **Auditing Advanced DP Systems: A Total Systems Approach.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 7-9, New York — **Information Systems Modeling Analysis and Planning.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-9, Dallas — **DP for Senior Executives.** Contact: Ed Green, Executive Education Center, Peat, Marwick, Mitchell and Co., 810 Seventh Ave., New York, N.Y. 10019.

Nov. 7-9, New York — **Introduction to Computer Concepts.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7-9, Chicago — **Data Base Management Systems: Concepts and Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-9, New York — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-9, New York — **Basic Systems Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7-9, Arlington, Va. — **Principles of Regression Analysis Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 7-9, New York — **Computer Awareness: Basic Concepts, Compatibility and Terminology.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 7-9, Houston — **Project Leadership Laboratory.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7-9, San Francisco — **Structured Testing Seminar.** Contact: McCabe and Associates, Inc., Suite 111, Twin Knolls Professional Park, 5501 Twin Knolls Road, Columbia, Md. 21045.

Nov. 7-9, Washington, D.C. — **Introduction to Office Automation: Concepts, Technology and Applications.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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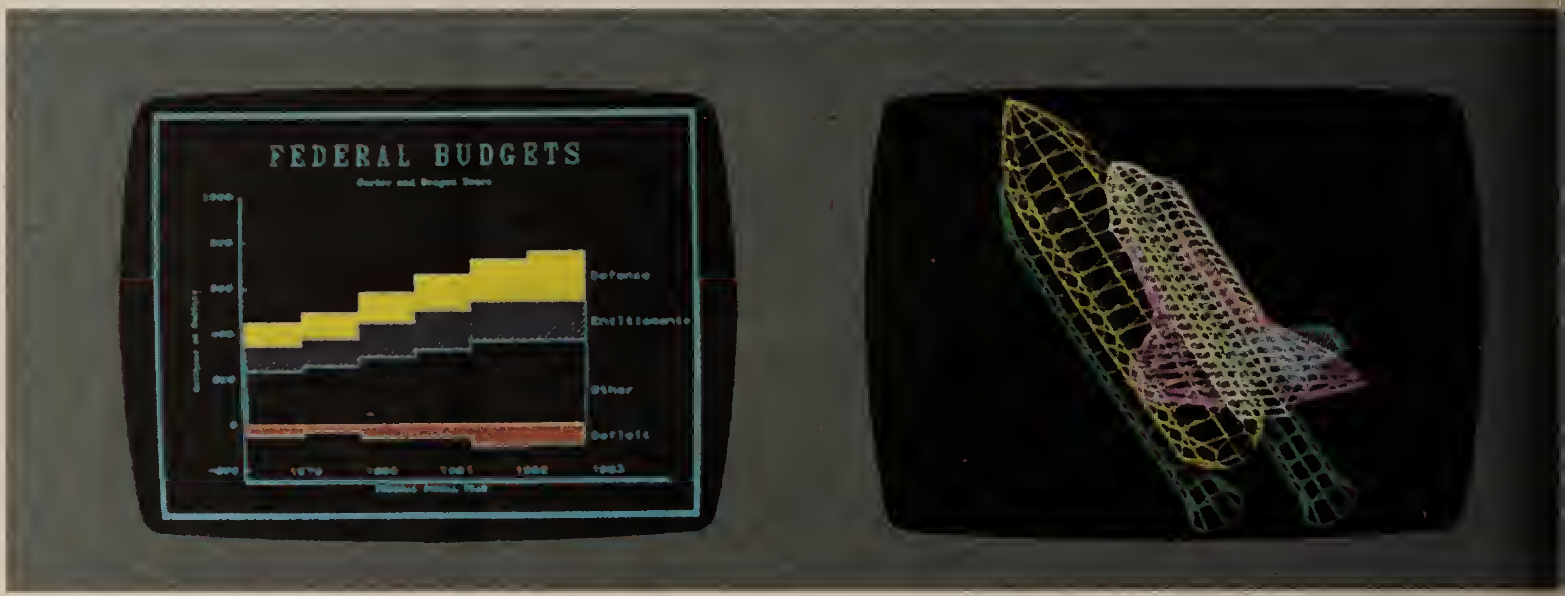
Nov. 7-10, Nashville, Tenn. — **The 1983 TSI International Information Exchange User Conference.** Contact: Jackie Baio, Information Exchange, 187 Danbury Road, Wilton, Conn. 06897.

Nov. 7-9, Washington, D.C. — **Electronic Spreadsheets.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 7-9, San Francisco — **Advanced Communications and Network Engineering.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7-10, Arlington, Va. — **Japanese Fifth-Generation Computer Technology.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Nov. 7-10, New York — **CICS On-Line Application Design.** Contact: Yourdon, Inc., 1133 Ave. of the



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Americas, New York, N.Y. 10036.

Nov. 7-10, Birmingham, Ala. — **Project Management.** Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Nov. 7-11, San Francisco — **Structured Programming Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7-11, Chicago — **Computer Software and Applications Conference (Compsac '83).** Contact: IEEE Computer Society, P.O. Box 80452, Worldway Postal Center, Los Angeles, Calif. 90080.

Nov. 7-11, Atlanta — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 7-11 in Seattle.

Nov. 7-11, Sunnyvale, Calif. — **Financial Analysis for Capacity Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Nov. 7-11, Boston — **Project Planning and Control.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 7-11 in Columbus, Ohio.

Nov. 7-11, New York — **Structured Analysis/Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Nov. 7-11, Pittsburgh, Pa. — **Systems Analysis Workshop.** Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814. Also being held Nov. 14-18 in Toronto.

Nov. 7-11, Houston — **CICS/VS Command Level.** Contact: Kaaren Perez, Comped, 10 E. 21st St., New York, N.Y. 10010.

Nov. 7-11, Sunnyvale, Calif. — **Structured Analysis for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 7-11, Columbus, Ohio — **Structured Analysis and Design Workshop.** Contact: Kaaren Perez, Comped, 10 E. 21st St., New York, N.Y. 10010. Also being held Nov. 11-14 in New York and Nov. 28-Dec. 12 in Chicago.

Nov. 7-11, Sunnyvale, Calif. — **Ada Software Engineering Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 8, Chicago — **CBX Evaluation and Selection.** Contact: Marilyn Chasteen, The DMW Group, 2020 Hogback Road, Ann Arbor, Mich. 48104.

Nov. 8-9, San Francisco — **The Fourth-Generation Data Management Software.** Contact: Software Institute of America, 339 Salem St., Wakefield, Mass. 01880. Also being held Nov. 14-15 in Washington, D.C.

Nov. 8-10, San Francisco — **Data Communications Concepts.** Contact: Suzane Galliart, Memorex Customer Education, M/S 03-16, 3393 Octavius Drive, Santa Clara, Calif. 95051.

Nov. 8-10, San Diego — **Sytek and San Diego State University's (SDSU) Second Broadband Local-Area Network Conference.** Contact: Mark Hall, SDSU/Sytek Conference, 1225 Charleston Road, Mountain Valley, Calif. 94043.

Nov. 8-10, San Francisco — **Local-Area Networks: Concepts, Technology and Products.** Contact: Technology Concepts, 730 Boston Post Road, Sudbury, Mass. 01776. Also being held Nov. 15-17 in Boston.

Nov. 8-10, Detroit — **CICS/VS Internals for Systems Programmers.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

Nov. 8-10, Andover, Mass. — **Business Applications for Computer Graphics.** Contact: Institute for Graphics Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Nov. 8-10, London — **Software/Expo Europe.** Contact: On-line Conferences Ltd., Pinner Green House, Ash Hill Drive, Pinner HA5 2AE, Middlesex, England.

Nov. 8-10, New York — **The Hammer/Seybold Executive Forum: Directions in Office Systems and Professional Computing.** Contact: Cheryl McManamy, Seybold Publications, Inc., Suite 801, 44 Bromfield St., Boston, Mass. 02108.

Nov. 8-10, Dallas — **CAM-I's 12th Annual Meeting and Technical Conference.** Contact: CAM-I, Inc., Conference Services, Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.

Nov. 8-10, Arlington, Va. — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

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Display samples courtesy of: Megatek and Precision Visuals, Inc.

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EDITORIAL

Stay Tuned

The concept of office automation — unlike many other concepts in the computer industry — is finally being backed up by a bevy of products and productivity aids.

In recent weeks, we have seen the introduction of such new technologies as image processing from Wang Laboratories, Inc.; an electronic mail network from MCI Telecommunications Corp.; and an advanced optical storage disk storage system from Storage Technology Corp.

Each of these announcements represents a new direction for office workers in the way they carry out their daily duties. Image processing of documents will allow insurance and financial institutions to process their forms more efficiently, while electronic mail will allow all of us to communicate more effectively.

The potential of optical disk storage boggles the mind with its capacity of 4G characters per disk — setting the stage for an office with few or no file cabinets.

Private branch exchange systems are also knocking on the office door as the AT&T divestiture forces businesses to become their own phone companies. As voice technology comes in, some data technologies, such as local-area networks, may be forced out the back door or at least more closely scrutinized.

High-end microcomputers such as Apple Computer, Inc.'s Lisa and integrated software packages such as Visicorp's Visi On for the IBM Personal Computer (due to be released this month) throw office automation into the same frenzy the rest of the computer industry is feeling with the decision of which machine/package is best for word and data integration.

But the challenge in office technology will be the successful implementation and use of these new products. The 1984 Office Automation Conference to be held in February in Los Angeles will present no fewer than 45 sessions designed to help managers in this goal.

Office technology will continue to evolve and develop along with the rest of the industry as new technologies are routed directly to the desktop. Which technologies will survive?

Stay tuned.

DATA PAST

Five Years Ago
Oct. 16, 1978

DETROIT — Thirty-three members of this city's Police Department were fingered by a crime-fighting computer project and charged with welfare fraud.

The 33, all women, were indicted after their names surfaced in a computer match that compared Police Department records with Michigan's welfare rolls.

— — —

NEWTON, Mass. — Data General Corp. expanded the Eclipse family's range of distributed processing applications when the company broadened the minicomputer line by adding two systems — one at the high end and another at the low end.

DG intended the entry-level system — designated the Eclipse C/150 — primarily for small, dedicated applications at the regional offices of Fortune 500 firms.

Ten Years Ago
Oct. 17, 1973

TULSA, Okla. — Judge A. Sherman Christensen admitted his "computation of antitrust damages against IBM involved substantial error."

In the unusual move, Christensen said he would grant IBM a motion either to amend the finding he issued in the telex-IBM case or else to grant IBM a new trial on the issue of damages.

— — —

WASHINGTON, D.C. — A bill calling for a Federal Privacy Board to protect individuals against "improper, incorrect or unauthorized compilation or dissemination of information" from computerized data banks was introduced into Congress by 27 members of the House of Representatives.

The bill, H.R. 9786, was considered a companion measure to the Federal Privacy Act.

'Land Ho!'

LETTERS

The '414' Group

After spending two months actively not reading any press covering the "414" group in Milwaukee, I was finally tipped off my edge when my eye caught the article "Teenage Hacker Lectures House on DP Security" [CW, Oct. 3]. It was enough that they had committed a crime. It was a farce that, as experts, they were given the floor of the U.S. House of Representatives.

I am 24 years old, an information systems designer, and I am recognized in my own little circle just as most of us would have it be. I, too, hacked at one time, but the 20-hour workweek of 414er Neal Patrick would pale next to my more than 100-hour weeks.

But the big difference between him and me seems to be that he sees no rules to the challenge and seeks it at the expense of others. I, on the other hand, had some element of respect for other people.

My one pleasure was to hear that Patrick was baited with a Star Trek program by the People at Security Pacific Bank. Touche! It brings to mind what is both a memory and a confession.

Only once have I performed a malicious act using a computer, and it was directed at a disrespectful hacker who had hacked once too often. I wrote a program that, when loaded, disabled user interrupts and then cycled through each of the user's files, first displaying its name and then purging it from the system.

For a finale, the program purged itself, its audit trail and then logged off (the program destroyed itself twice during testing).

After completing my program, I saved it under the name "Star Trek" and then posted a letter in the electronic bulletin board telling my victim about a great new version of the classic game. He fell for it.

An amateur hacker always falls for it.

Bart Wolther
New York, N.Y.

DP Crime Legislation

The editorial "Just Another Kid" [CW, Sept. 19] expressed *Computerworld's* view on legislation dealing with computer crimes.

As an avid reader of *Computerworld,* I find it difficult to believe that a periodical that has provided professional reporting on the increasing number of computer-related fraud and abuse incidents (the majority of which were not the electronic joyriding that was characterized) would present such a set of postulates on this serious subject.

If *Computerworld* further evaluates its position on the matter of computer crime, I believe it will find a growing number of voices from the industry and professional societies that support the need for federal computer crime legislation.

Moreover, these groups are providing positive support by suggesting specific language and/or objectives for the pending federal legislation (H.R. 1092 and S. 1733).

While it is true that most information system managers know the old adage "An ounce of prevention is worth a pound of cure," it is expected that crimes of fraud, theft or interference perpetrated on interstate data communications systems will continue and will only be mitigated by greater utilization of user-specified controls and security mechanisms, together with specific legislation that prescribes the unauthorized access, interception, use, modification and/or destruction of computer data bases, systems and networks.

Henry M. Kluepfel
Mendham, N.J.

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LECHT ON SCIENCE/Charles P. Lecht

Supercomputers: More Than Just for Defense

This is the third of a three-part series on supercomputer development in the U.S.

If it were solely a question of critical needs in the national security and defense areas, we could not afford to be anything other than first in supercomputer development. Right off the bat, then, we can see that some government funding of such a program is mandatory, not to say inevitable. But what level of support are we talking about? Should Uncle Sam underwrite all development costs? I say no: But he may have to unless the supercomputer establishment confesses that supercomputers have a commercial marketplace.

Unfortunately, the fact that supercomputers today are widely viewed as little more than super "number crunchers" contributes to their being yet more unjustly perceived as the overpriced, hybrid offspring of souped-up calculators and Pac-Man-like games, in the playing of which greater and greater quantities of taxpayer dollars stand to be gobbled up at lightning speed to no known end.

This rather simplistic misconception carries with it the unflattering corollary that scientists who use supercomputers are no more than extravagantly self-indulgent electronic game freaks, driven by an eccentric compulsion to beat one another at "flops" (floating point operations per second) or "lips" (logical inferences per second). It's no wonder that there is debate over whether supercomputers should be made at all, let alone over who should bear the costs of their development.

Pure Research Bias

That some earnest spokesmen at the National Security Agency/Los Alamos National Laboratory Conference on the frontiers of supercomputing (Los Alamos, N.M., Aug. 15-19, 1983) voiced the opinion that there were, in fact, no viable commercial uses for supercomputers is clearly attributable to their natural and unsurprising biases as pure research scientists.

But others, both in and out of government, so clearly took up this position out of pure self-interest that the goal of the meeting — namely, to achieve consensus on how to proceed with supercomputer development in America — suffered. Their avowed arguments for full government subsidization of supercomputer development, all based on their contention that there is no commercial marketplace for these devices, will backfire.

Historically, the exertions of such people have been responsible for lessening the American public's support for anything so far removed from its perceived, day-to-day interests. Should this happen again now, it would be tragic. It would cause needless delay in our realization of the supercomputer's fantastic benefits, have a decidedly adverse impact upon the U.S. economy and cause a whole lot of other bad things to happen, too.

The future role of supercomputers in helping to secure and hold the commercial high ground is already perfectly obvious. The amount of raw computer systems power, of which the supercomputer stands to be our epoch's most significant multiplier, is a key factor in protecting and extending whatever advantages we have been able to gain thus far in the vital arenas of trade and commerce in a world "gone electronic." This alone should cause us to conclude that private, as well as government, investment in supercomputers is warranted.

But there are many other reasons supporting a decision in favor of private investment, some having to do with more immediate rewards in other sectors — rewards that may only be obtained via supercomputer-based activities.

Such benefits, once fully appreciated, would leave only the most penurious, short-sighted stockholder/taxpayer feeling the need to deny the funds required.

Robust Market Potential

A beautiful and robust marketplace potential is emerging for these devices, and for the powers they offer, wherein there is no shortage of incentives for investment. All the major components of our increasingly service-based economy rely upon commensurately increased automation for their growth. Education, financial services, entertainment, library science, marketing, you name it: Current systems are unable to handle the burgeoning work load in such areas.

New, faster symbolic and numeric processors are needed; and while some gains may be made by tying current systems together, more spectacular results will be achieved only by increasing the power in the bases of all systems — the chip (memory and logic) and the software.

We must create memories so large that their attendant processor systems remain incapable of filling them up in their (the processors') "lifetimes." These processors must be built to operate such memories in a way that makes information storage and retrieval virtually instantaneous.

Furthermore, they must be endowed with powers of reasoning — the ability to induce, infer and analogize — such that life's most urgent questions, those bearing on the improvement of man's lot, can be put to them and solved. Software must be created that allows us considerable latitude in how we communicate our wishes to supercomputer systems and can exercise judgment when we do so ambiguously, generating no malignant contradictions in the process.

Supercomputer applications can so enrich our lives that I foresee an endlessly receptive marketplace for their "products." In the medical field alone, great financial savings (not to mention the obvious benefits of a long and healthy life) are achievable; our commitment to support the application of the supercomputer to work in such fields as this furnishes us with our most compelling arguments for combined private and government funding. These are arguments that the overwhelming majority of Americans can understand.

For example, now inhibiting discovery of a cure for certain types of

(Continued on Page 51)

HUMAN CONNECTION/Jack Stone‡

ACM Meeting to Tackle DPer Obsolescence

For the very latest insights into the research addressing the problems of out-of-date DPers, you should consider attending the upcoming conference of the Association for Computer Machinery's (ACM) Special Interest Group on Computer Personnel Research, scheduled for Nov. 17-18 at the McIntire School of Commerce at the University of Virginia in Charlottesville, Va. I believe that this event marks the first time that the obsolescence issue has been addressed head-on and represents another milestone achievement in the leadership of this forward-thinking organization.

I had the opportunity to preview some of the papers that will be presented and thought it might be useful here to provide brief abstracts of those that seemed particularly interesting:

- "The Information Center as a Middle Ground in Offsetting Personnel Obsolescence," by Herman Hoplin.

The need for realignment and updating specialists and developing methodologies to offset obsolescence has, in part, arisen from the reluctance of many organizations to permit decentralization of DP operations — even in the face of growing backlogs and users malcontent with DP services.

The strong trend to microcomputers has not only forced organizational changes, but created voids in the work force and generated obsolescence in existing technical staff who were attempting to perform an applications role for which they were ill-prepared.

Organizational changes toward an information center as the middle ground between the computer organization and the users offer great promise to realign the work force and create dual career paths.

The primary purpose of the paper is to present the profound impact of the information center on organizations and individuals, the concept's congealing force that is now patterning organizations forged around user interfaces and environments and the dramatic effect of evolving an organization essentially with an innovative and effective mechanism for merging the organization and function islands of information systems and services.

- "Stress in the Information Systems Professional," by John M. Ivancevich, H. Albert Napier and James C. Wetherbe.

This paper describes recent research dealing with the occupational stress levels among information systems personnel and was based upon a self-report stress and health behavior instrument completed by 580 respondents in 18 corporations in the U.S.

The data indicated that various job factors are perceived as stressful by the respondents, but the levels reported were not as excessive as had been found in studies of other occupational groups. To clarify stress profiles, the data was also examined on the basis of position held, service years and sex.

- "A New Breed of Computer Professional — The Information Specialist," by Donald L. Davis.

Increasing concerns on how to provide managers with the right information for decision making has led to broader acceptance of the decision support system (DSS) concept and other new organization ideas. In turn, there is a growing need for a new category of computer professional, the information specialist — someone who works closely with the decision maker.

One of the information specialist's major tasks is to assemble the hardware and software from the DSS generator that may be required for a specific DSS.

The job may require many of the characteristics of systems analyst and designer, programmer, operator, communications specialist, operations analyst, human factors specialist and staff adviser.

- "Supervision in Management Information Systems: A Call for Research," by Robert P. Bostrom and G. Nicholas Hopkins.

Personnel turnover, applications backlogs, employee dissatisfaction and low productivity are only some of the problems faced by information systems managers. This paper suggests a link between these and other pervasive problems and the quality of supervision received by information specialists and proposes several research issues that ought to be addressed.

READER COMMENTARY/Robert W. Hassett‡

Some Procedures for Copyright Registration

This article deals with copyrights in computer programs. The standard procedure for registering a copyright in a computer program is described below, the advantages and disadvantages of registration are discussed, and alternatives to the standard registration procedures are addressed.

The copyright registration process can be broken down into three steps:

- Telephone the U.S. Copyright Office hot line for forms at (202) 287-9100, and ask for form "TX." You should receive the form in the mail in about one week.
- Place a "copyright notice" on each copy of the program. The word "copyright," followed by the year of first "publication" and the name of the owner, is a sufficient copyright notice. "Publication" consists of distribution of copies of the program to the public by sale, license or otherwise.

An example of a sufficient notice is: "Copyright 1983 Computsoft, Inc."

- Complete and forward form "TX," along with a check for $10 and one copy of a printout of the program, including the title page with the notice, to the Copyright Office address, which is provided on the form. If the program is longer than 50 pages, provide only the first and last 25 pages of the program together with the title page, including the notice of copyright. The middle portions of the program are thereby deemed registered.

Clients frequently ask about treating a number of different programs as one program. The thought behind this is that they can use programs that are not confidential for the first and last 25 pages preserving the confidentiality of the remainder.

Processing of these applications is now taking approximately 16 weeks.

Personnel in the Copyright Office are very helpful in answering questions concerning procedures. Their number is (202) 287-8700. Getting through to this number takes about two weeks.

Two Advantages

There are two advantages to registration:

- Registration is required before filing a lawsuit for copyright infringement. Valuable time can be lost after an infringement has occurred while the owner is registering the program.
- As a general rule, unless a program has been registered before an infringement begins, the owner is not allowed to recover attorney fees or certain statutorily determined damages in a lawsuit for that infringement. In that situation, the owner may recover only his actual damages and the infringer's profits (not included in the actual damages) resulting from the infringement. Proving the actual damages and the infringer's profits in court can be difficult and expensive.

There are two disadvantages to standard registration. Both result from the fact that whenever a computer program is registered and "published" (publication includes the sale or licensing of copies), the portions of the program provided to the Copyright Office are then available for examination by the public. In most situations, the disadvantages far outweigh the advantages.

The first disadvantage is that other persons can then utilize the program without the permission or knowledge of the owner. If only the ideas, and not the language of the program, are utilized, this action would not be illegal and could not be stopped even if the owner knows of the use.

The second disadvantage involves state law. Under the law of most states, confidential and unique technical in-

(Continued on Page 52)

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Rheinlans Versicherung AG
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Royal Insurance Company of Canada
Safeway Canada
St. Elizabeth Hospital
St. Francis Hospital
St. John Medical Center
SI Handling System, Inc.
SONAT Offshore Drilling, Inc.
Sony (UK) Ltd.
Southwestern Public Service
Tacoma Public Schools
Teacher Retirement System of Texas
Teachers Insurance & Annuity Association
Texas Electric Service Co.
Thatcher Glass Manufacturing Co.
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The Supercomputer's Commercial Marketplace

(Continued from Page 49)

cancer is our inability to gather and process the massive volumes of data needed to clarify our view of our biological selves and to create the simulations needed to conduct experiments quickly. Improved CAT scanning via supercomputer image processing, allowing us to see what would otherwise remain unseeable, should speed our development of such cures decisively. The same could be expected in the case of other major diseases for which there now exist no cures.

I'm not saying that supercomputers alone can effect cures, but they are essential to the discovery process; in their speed and versatility resides the hope of breakthroughs.

The list of commercial applications awaiting improved numeric and symbolic supercomputers is as endless as we care to imagine. Better airframe design through electronic wind tunnel simulations will lead to lower manufacturing costs and safer transportation for business trips and holidays. Petrochemical research will yield cheaper and safer fossil fuels; the same can be said of nuclear energy. Better economic modeling could alleviate the unhappier consequences of imbalances in the supply/demand equation. Better structural modeling would yield manifold benefits to our architects, bridge builders and city planners. Better weather prediction techniques could save us from catastrophic surprises.

That our government must participate in helping to create supercomputers, especially our early ones, is not unreasonable. The positive effects of its involvement will be felt by all of us: We must, perforce, endorse it. Pleas for government subsidies, however, will be met with a friendlier countenance if we base them not upon the absence of a commercial marketplace, but upon the certainty of its presence.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

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The lower-priced Smartmodem 300 is ideal for local data swaps and communicates at 300 bps. A built-in speed selector on Smartmodem 1200 automatically detects transmission speeds (110, 300 or 1200 bps).

Smartmodem 1200B™ is also available as a plug-in board for IBM® Personal Computers. And Hayes manufactures the Micromodem IIe® for Apple® II, III, IIe and Apple Plus computers, as well. It comes packaged with Smartcom I™ communications software.

Speaking of software, more programs are written for Hayes modems than for any other. And that impressive list includes our own incomparable communications software. **Smartcom II™ Complete, menu-driven software for the IBM PC, DEC Rainbow 100™ Xerox 820-II™ and Kaypro II.™** Even first-time communicators will find success with Smartcom II. Screen prompts guide users in the simple steps it takes to create, send, receive, list, edit, name and re-name files.

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The program reduces lengthy dial-up and log-on sequences to a single keystroke. It stores communications parameters for 25 remote systems.

Plus, there's an on-line help feature that explains prompts, messages and parameters.

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If you're involved in linking micros or setting standards for configurations, remember this. Everything your people need to know about communications can be summed up in one word: Hayes.

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Smartmodem Specifications:
Low Speed Data Format: (Smartmodem 1200 and Smartmodem 300) Serial, binary, asynchronous; 7 or 8 data bits; 1 or 2 stop bits; odd, even or no parity (0-300 bps).
High Speed Data Format: (Smartmodem 1200) Serial, binary, asynchronous; 7 data bits; 1 or 2 stop bits; odd, even, or fixed parity or 8 data bits; 1 or 2 stop bits; no parity (1200 bps).
Dialing Capability: Touch-Tone® and rotary-dial pulse dialing.
Command Buffer: 40 characters.
Commands: (unnecessary with Smartcom II software) A: Immediate answer. A/: Repeat last command. C: Transmitter Carrier. D: Dial command, including simple dialing, waiting for second dial tone, auto-dialing and other features. E: Local echo. F: Full/half duplex. H: Switch hook. M: Audio monitor. O: On-Line. P: Pulse dialing. Q: Quiet mode. R: Reverse originate/answer mode. S: 17 "Set" commands speed, escape code character, number of rings to answer on, etc. S?: Checks operational parameters above. T: Touch-Tone dialing. V: Verbal result codes.
Result Codes: (can be numerical/verbal): 0/OK: Command line ok. 1/Connect: Carrier detected. 2/Ring: Phone is ringing. 3/No Carrier: Carrier lost or never heard. 4/Error: Error in command line. 5/Connect 1200: Carrier detected at 1200 bps. (Smartmodem 1200 only.)
Audio Monitor: Two-inch speaker with volume control.
Rear Panel: On-off switch, power jack, RS-232C connector, modular phone jack connector, volume control.
Operation: Full or half duplex.
Data Rate: 0-300 bps and 1200 bps for Smartmodem 1200; 0-300 bps for Smartmodem 300.
Interface: RS-232C.
Intelligence: Z8™ microprocessor with 4K byte control program for Smartmodem 1200; Z8 microprocessor with 2K byte control program for Smartmodem 300.
Modem Capability: Bell System 103 or 212A compatible originate or answer mode for Smartmodem 1200; Bell System 103 compatible originate or answer mode for Smartmodem 300.
Receive Sensitivity: –50dBm for Smartmodem 1200; –45dBm for Smartmodem 300.
Transmit Level: –10dBm.
Registration: FCC registered for direct-connect to the nationwide phone system. Connects with modular jacks RJ11W, RJ11C, RJ12W, RJ12C, RJ13W, RJ13C.
Power Pack: U.L. listed 120VAC, 60Hz, 13.5VAC output.
Size: 1.5" × 5.5" × 9.6"

Some Copyright Registration Procedures

(Continued from Page 50)

formation is considered to constitute a trade secret. Any person having a confidential relationship with the owner of a program — including employees and, if specified by contract, licensees and other customers — is prohibited from using, duplicating or disclosing the owner's trade secrets.

Trade-secret protections are in some ways broader than copyright protections in that trade-secret law protects both the expression of ideas, in the form of a program or otherwise, and the ideas themselves. Copyright laws generally protect only the wording of the program.

On the other hand, trade-secret protections apply only so long as the ideas are disclosed only to those persons whose knowledge is essential. With the exception of disclosures obtained illegally, any dissemination of the information to other persons not having a relationship of confidence with the owner eliminates any and all trade-secret protections. A sure way to make public and, thereby, destroy the trade-secret status of all, or a substantial portion, of a program is to register the program.

In spite of trade-secret laws, preserving copyright protections is desirable because confidentiality and, thus, trade-secret status, can so easily be lost inadvertently. Thus, with respect to computer programs, copyright laws should be thought of as a backup to trade-secret law.

'Notice of Copyright'

Registration is not required to preserve a copyright. All that is required is that prior to "publication" (including sale or licensing) a "notice of copyright" be placed on the program.

Usually, the owner who places a notice of copyright on his material is required to deposit that material with the Library of Congress even if the copyright is not registered. However, computer programs that are published only in machine-readable form are not subject to this requirement. So copyright and trade-secret protections may be preserved simultaneously.

Aside from the time delay caused by this requirement, registration will require the deposit with the Copyright Office of at least a substantial portion of the program, resulting in a loss of confidentiality of those portions. Thus, suing for infringement is a lot like cutting off grain sales to the Soviets. The registration necessary prior to suing the infringer results in the program being made available to the public, which is likely to be more detrimental to the owner than the suit is to the infringer.

There is a solution to this problem. The Copyright Office has issued regulations providing that in certain situations, "special relief" will be granted that will preserve the confidentiality of materials deposited. The problem is that no one knows under what circumstances this relief is applicable.

The Copyright Office is currently accepting comments concerning this procedure. In the meantime, where it is considered sufficiently important, it is certainly reasonable to request such special relief in registering copyrights in computer programs.

If any of the ideas in this article is applicable to your company's computer programs, it is recommended that you discuss these matters with your attorney. There are three reasons why such discussion is advisable:

- Trade-secret laws vary from state to state. The law in your state may be different from the law discussed.
- There are many exceptions to the rules that have been discussed. An exception may make the discussion inapplicable to your situation.
- The law in this area is continually being changed. Changes in the law may require strategies different from those suggested here. In most cases, the time and expense of obtaining such legal advice will be minimal.

Hassett is an attorney at Gort, Hassett, Shannon & Slater in Atlanta, Ga.

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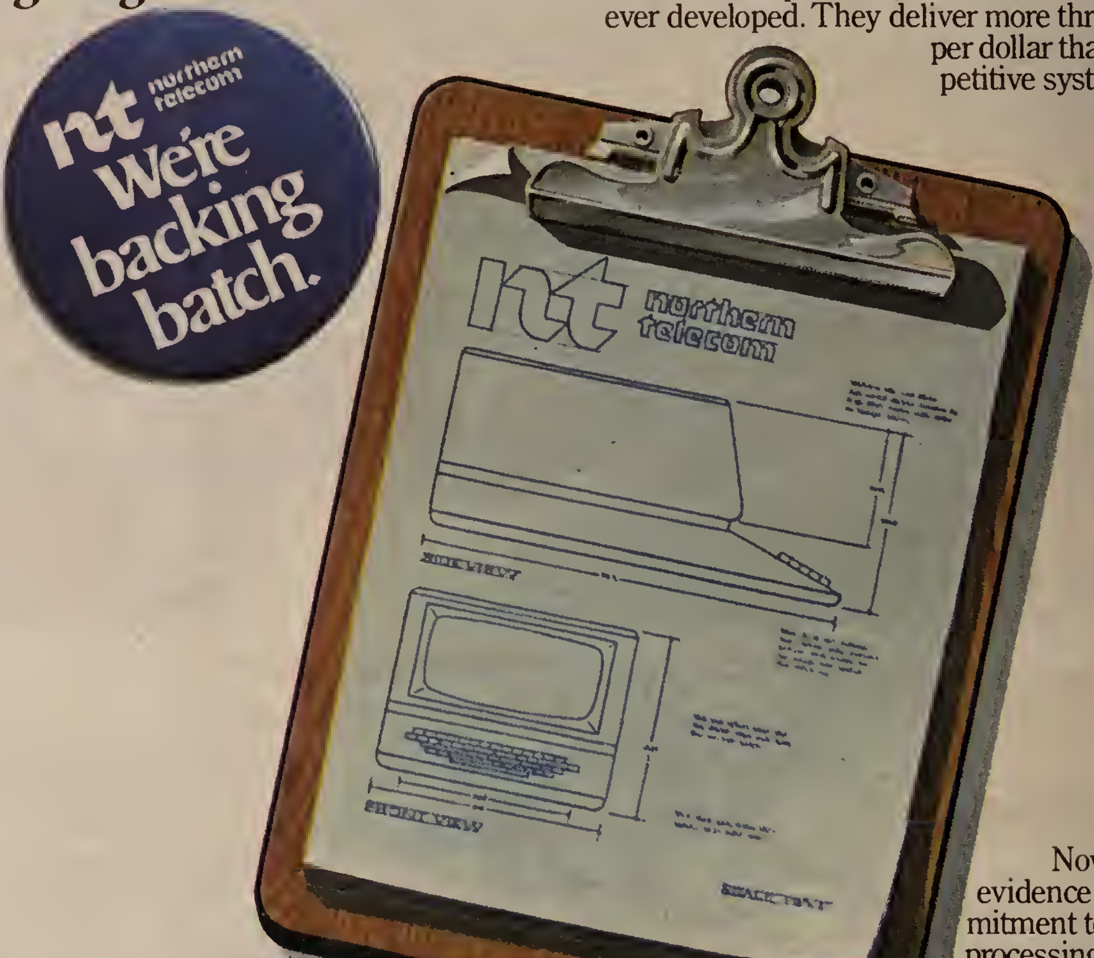
A benchmark in batch processing
that keeps getting better.



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GETTING AHEAD IN DP/Donald J. Berardo‡

Improve Your Place in DP With 'Egograms'

In sports, and in life, you need to think about who the players are if you want to do well in the game. People have positions and titles that allow them many benefits because of their positional authority. You cannot buck them or their positions directly, for you will undoubtedly lose in the end. The best you can do to help your upward mobility is to learn to identify the games and the structure as best you can so that you can become a much better player.

In order to position yourself better as a star player in the game, you'll have to make some basic assumptions about who is in power, their heirs apparent and why they are there.

To start the process, ask yourself "Who are the most powerful people in my area?" "Powerful" is defined as anyone who can directly impact your salary, job functions, status, promotability and fireability.

After you've developed this list, make some "egograms" — short, descriptive statements about the critical players that will become your scorecard.

For example: Joe S. — Three years with the company, now senior analyst of accounting/applications. Generally dresses very well and is married and lives in the same town as the boss. Has two junior analysts under him. Has been in DP for about six years and probably earns $19,000. Does not socialize too much with the staff and always goes to lunch with the "biggies." Gets most vocal in project start-ups and wrap-ups.

Develop as many egograms as you can for the power players in your area. Test all of your assumptions by further observations to get as accurate a description as possible. What other facts or facets can you identify about these people? After you have a full scorecard that describes all the players, it is time for your review.

Spot Patterns

Try to spot the patterns. What factors consistently show up in the egograms of the successful people? Is it their technical skills? Their appearance and public speaking?

Each company's DP area will stress different aspects of an individual's personal/technical abilities as its success criteria. You have to determine what is important to the people who control your future.

I am not suggesting that you become someone who you are not, but only that you must be able to adapt to the demands of the world surrounding you at work.

If you find that you cannot change your playing style to succeed in the game, then you may have to accept the results. You may not move from where you are in responsibilities or rewards.

But if you can effectively see your own strengths, assess the areas that need development and apply your energies to the most critical factors, then you can become a much more knowledgeable and successful player.

Berardo is a management counselor and career therapist. He is vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

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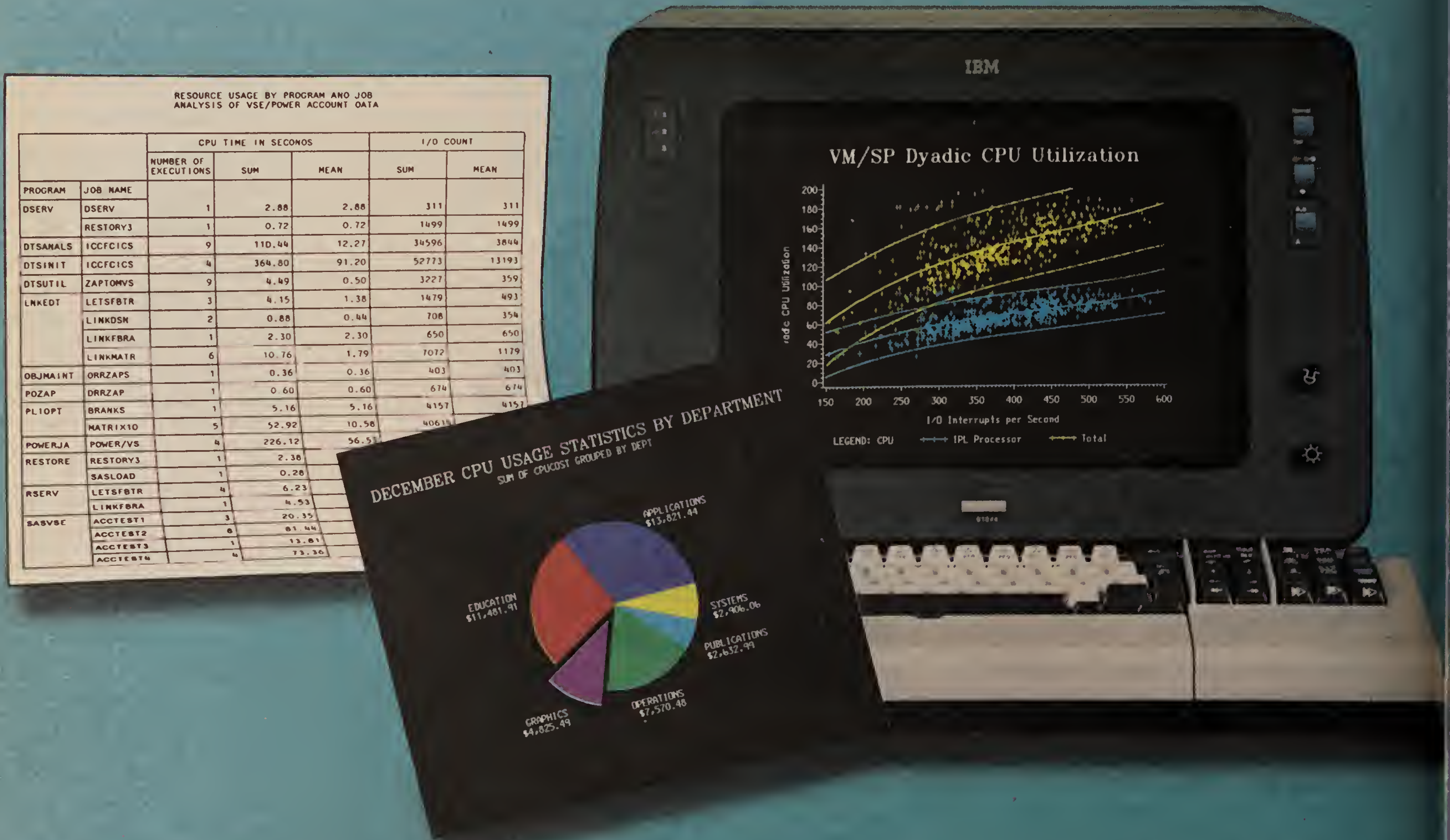

RESOURCE USAGE BY PROGRAM AND JOB
ANALYSIS OF VSE/POWER ACCOUNT DATA

		CPU TIME IN SECONDS			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
PROGRAM	JOB NAME					
DSERV	DSERV	1	2.88	2.88	311	311
	RESTORY3	1	0.72	0.72	1499	1499
DTSANALS	ICCFCICS	9	110.44	12.27	34596	3844
DTSINIT	ICCFCICS	4	364.80	91.20	52773	13193
DTSUTIL	ZAPTOMVS	9	4.49	0.50	3227	359
LNKEDT	LETSFBTR	3	4.15	1.38	1479	493
	LINKDSN	2	0.88	0.44	708	354
	LINKFBRA	1	2.30	2.30	650	650
	LINKMATR	6	10.76	1.79	7072	1179
OBJMAINT	ORRZAPS	1	0.36	0.36	403	403
POZAP	DRRZAP	1	0.60	0.60	674	674
PLIOPT	BRANKS	1	5.16	5.16	4157	4157
	MATRIX10	5	52.92	10.58	4061	
POWERJA	POWER/VS	4	226.12	56.5		
RESTORE	RESTORY3	1	2.38			
	SASLOAD	1	0.28			
RSERV	LETSFBTR	4	6.23			
	LINKFBRA	1	4.53			
SASVSE	ACCTEST1	3	20.35			
	ACCTEST2	8	81.44			
	ACCTEST3	1	13.81			
	ACCTEST4	4	73.36			

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DP Must Leverage Programmer Productivity

By Bryan D. Stolle
Special to CW‡

Timely and accurate information has become the lifeblood of many organizations, yet the process of creating, manipulating and accessing this crucial resource is often the most unproductive aspect of these organizations.

The training and specialization required to design and operate an automated system excludes non-DP professionals from its management. As a consequence, DP shops have been burdened with the responsibility for most of the information systems in an organization, often without the corresponding authority and control.

Responsibility without control creates an antagonistic environment. DP management time is wasted in external conflict with various end-user groups. Also, the battle that ensues every time a new hardware, software or personnel acquisition is requested discourages needed enhancements.

Significant numbers of DP shops are also locked into decade-old programming languages. They gradually sink into a morass of project backlogs, impromptu end-user report requests and maintenance of excessive or undocumented code. Sloppily written, poorly documented and superficially tested programs are released to end users only to return to the backlog queue for corrections.

Management of the total environment with overall productivity and efficiency must enter the DP management philosophy. More importantly, top management must support this effort and provide the necessary authority as well as the responsibility.

Data base management systems (DBMS), application generators and fourth-generation languages have all been developed to address some of these problems. These systems allow one program to do the job of many similar programs specific to applications throughout the user community. Nonprocedural data base languages allow users to create applications with a few easily followed commands. Lastly, impromptu report requests are handled easily by report generators.

(Continued on Page 58)

Provides Information Center Reporting

'Imagine' Targets CICS/VS Environments

CAMBRIDGE, Mass. — Multiplications, Inc. has announced Imagine, an information center reporting and querying system for IBM CICS/VS environments.

Imagine features an entirely menu-driven architecture for specifying queries or reports. The specifications can then be executed on-line under CICS or in batch. A logical view of data for end users without modifying or reformatting existing files is also featured.

Imagine directly reads existing IBM Vsam, Isam or sequential files and integrates them into an informational data base to provide a logical view of data. Data conversion or added overhead is not required, a spokesman said. There are no limitations on the number of files that may be logically joined to create tabular views of the data base. Logical views of the same data may be customized to each user group.

The product also permits a system administrator to control user access to data and computing resources, the spokesman said. Security facilities control data access by file, field, field value, report and logical view for each user.

An integrated print management system allows report specifications and output to be stored under individual user passwords or defined as system reports and made available to all users.

Imagine is fully integrated with Accolade, Multiplications' CICS application development system. Imagine is available on IBM OS/MVS, OS/VS1, DOS/VSE and DOS/MVT versions and executes in conjunction with CICS/VS Releases 1.5 or 1.6. The DOS/VSE version will be available Jan. 1.

Until Jan. 1, a perpetual license costs $41,650 for the OS version and $31,500 for the DOS version. After Jan. 1, the price increases to $59,500 for OS, $45,000 for DOS. Multiplications is at 1050 Massachusetts Ave., Cambridge, Mass. 02138.

Modules Operational On IBM 4361

GREENBELT, Md. — Martin Marietta Data Systems, Inc. has announced that five of its Modular Application System (MAS) products will be fully operational on IBM's new 4361 Model Groups 4 and 5.

They are: MAS-Manufacturing, MAS-Payroll, MAS-Personnel, MAS-Decision Support and MAS-Project Management.

MAS-Manufacturing is priced between $25,000 and $179,000; MAS-Payroll from $19,000 to $39,000; and MAS-Personnel between $19,000 and $73,000. Martin Marietta is located at 6303 Ivy Lane, Greenbelt, Md. 20770.

DEC Announces Packages for VAX

CONCORD, Mass. — Digital Equipment Corp. has introduced two VAX-11 software products for commercial and industrial ventures.

The VAX-11 Application Control and Management System (ACMS) product set is a two-part software package for development and execution of transaction processing applications. The VAX-11 Data Base Management System (DBMS) Version 2 is a new version of the DBMS with added security features, enhanced performance and improved control utilities.

The VAX-11 ACMS is a fourth-generation language facility intended to reduce the life cycle costs of designing, developing, controlling and maintaining applications.

The ACMS product set is the sixth component in the VAX information architecture and interacts with the other five to manage applications in

(Continued on Page 56)

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VAX-11 Software Targets Commercial Ventures

(Continued from Page 55)

volving many users and large data bases. It reportedly provides a consistent, menu-driven operator interface for application execution, ensuring data base integrity and minimizing the use of system resources.

Implementation in an ACMS environment reduces complex applications to small steps. It uses existing VAX-11 information architecture to handle portions of the application and ACMS tools for the remainder.

The VAX-11 ACMS product set comprises two components: VAX-11 ACMS/AD, for developing applications; and VAX-11 ACMS, for monitoring and controlling execution of applications developed with VAX-11 ACMS/AD as well as those developed with existing VMS tools.

The VAX-11 ACMS/AD portion of the product set, used primarily by application designers and programmers, replaced most traditional application code with structured, high-level definitions, resulting in smaller programs with greater ease of implementation and maintenance.

The VAX-11 ACMS portion of the product set supplies the operational environment for ACMS/AD-defined tasks as well as other existing applications running under the VMS operating system. It enables creation and changing of menus for task selection, control of user and terminal access to ACMS applications and menus and allocation of system resources.

The VAX-11 ACMS product set, including both development and execution software, is priced at $15,000. The VAX-11 ACMS component is also offered separately for $5,500.

The VAX-11 ACMS/AD component will be available separately only as an application development upgrade package where a VAX-11 ACMS license is already present. The price is $10,000.

Version 2 of the VAX-11 DBMS provides a security schema in addition to the data base schema, application subschema and storage schema under the earlier version. The security schema controls the user's ability to execute data manipulation language verbs, to modify data items and to access record instances.

The VAX-11 DBMS system license, with full support, documentation and media, is priced at $20,000. A runtime-only version of the VAX-11 DBMS, which executes applications developed with the complete development version, is also available after purchase of a full DBMS system license for a fee of $4,000.

The Version 2 and the VAX-11 DBMS runtime system will be ready in January. More information is available from DEC, 200 Baker Ave., Concord, Mass. 01742.

Forth/370 Out For IBM CPUs

FREDERICK, Md. — Ward Systems Group has introduced an interactive micro language for IBM mainframes.

Forth/370 was designed for IBM and IBM-compatible mainframe users. It runs under either VM/CMS or MVS/TSO with program compatibility to many micro Forth systems.

Forth/370 disk files are compatible with and can be accessed by the host operating system. Files can be edited either by the Forth editor or by the CMS or TSO editor. It also contains an assembler.

The system is available on a 30-day free trial and may be used on all of a firm's CPUs for a one-time charge of $1,350. Source code is also available.

More information is available from Ward Systems at 8013 Meadowview Drive, Frederick, Md. 21701.

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Software Tools Announced for DEC VAX-11

PHOENIX — Data Base Systems Corp. has announced the Transact and Entry software tools for the Digital Equipment Corp. VAX-11 system running VMS.

The packages utilize VAX/VMS native-mode architecture and provide access to all VAX-11 RMS functions, a spokesman said. The products are said to improve productivity in applications development for both programmers and nonprogrammers and offer extended functionality and program efficiency.

Transact is said to develop, maintain, operate and administer on-line transaction processing for specific user applications.

It is menu-driven and can be used as a stand-alone system or by analysts and application developers for implementing complex transaction systems.

Entry is said to be a comprehensive general-purpose data entry facility that allows nonprogrammers to create, maintain, operate and administer a data entry operation. It provides menu-driven interactive development and actual data input operation, screen definition, screen-linking, key verification, editing and table verification.

Each package is priced at $12,500, according to the company.

Data Base Systems is located at 1846 E. Camelback Road, Phoenix, Ariz. 85016.

Candle's 'Epilog/MVS' Enhanced With Page Data Set Statistics

LOS ANGELES — Candle Corp. has announced Version 200 of its installation performance management system, Epilog/MVS.

Version 200 reportedly provides enhanced resource information to include page data set statistics, a user-controllable automatic analysis feature displaying information about relevant resources.

Another enhancement is the System Performance Navigator, which allows a user to navigate through historical information on service levels, work loads, response time, degradation causes and resources, a spokesman said.

Epilog/MVS runs on any IBM and compatible computer operating under the MVS or MVS/XA operating systems. It is priced at $19,500 from Candle, Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

DP Must Learn to Leverage Programmer Productivity

(Continued from Page 55)

DP management gains a great deal of control over the entire environment with these tools. An even greater benefit, though, is that this environment can be easily integrated. Equally important, the productivity and efficiency of enhancements and maintenance becomes more cost-effective.

While DBMS and other fourth-generation tools have gone a long way toward improving productivity, problems still remain. The inefficiencies of excessive and redundant programs and data have been replaced by the need for extensive and specialized know-how and design skills.

The complexities of most current DBMS offerings require considerable investments in new training and detailed data base design studies.

Another problem is in the area of integration. It is not uncommon for a DP shop to spend considerable resources to integrate software packages into a DBMS. Often the individual application could have been produced more efficiently as a stand-alone system.

It is also not uncommon for a project to be well under way before it is discovered that the DBMS cannot provide the needed level of sophistication to complete the project without performing major DBMS enhancements. DP management must be certain it thoroughly understands its needs and requirements before a software package is procured.

Problems experienced by the end user must also be addressed. Although they claim to be "English-like," many DBMS query and report generator systems are still very cryptic and inflexible. Often, integration between end-user application programs and software tools is less than transparent, at times requiring complex manipulations and the transfer of data and information. The result is that the end-user becomes frustrated, placing his needs right back into the DP department's lap.

These problems and others have spurred the drive toward artificial intelligence concepts and capabilities in both the user interface "front end" and the data management "back end."

The integration of data-driven functions, a natural English interface and a transparent self-generating DBMS illustrates an approach to fifth-generation information systems.

The DP professional of the future will be concerned with designing information system processes as opposed to software. This "ultimate" in programmer and end-user productivity leverage is a most welcome development.

Stolle is marketing director at Technical Systems Associates in Houston.

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Maintains Independent Data Dictionary

Sourcerer I Fits Honeywell Large-Scale Systems

NEW YORK — Scientific & Business Systems, Inc. (SBS) has announced the availability of an online systems development environment for Honeywell, Inc. large-scale systems.

Sourcerer I, a product of Galler Automation Industries, Inc., is said to maintain an extensive system-independent data dictionary. It also enables composition of CRT forms, generates source program routines and provides on-demand system and program documentation.

A spokesman said the product's data dictionary, forms generation and source generation capabilities eliminate the need to redefine system elements even when creating additional systems. The data dictionary provides a central cross-referenced bank of information containing all parts of the system, so that any part can be amended as an independent entity and properly assembled into each application program which requires it. It maintains file, record and data element definitions and allows for multiple relationships, so that a single generic data element can reside in multiple records.

The forms generator allows application forms to be painted. Variable fields are then uniquely related to data elements in the data dictionary. Stand-alone applications programs may be assembled from the cross-referenced components.

Sourcerer I is available for immediate delivery to users of Honeywell's DPS 8 or Level 66 systems operating under Honeywell's Gcos 8 and DM4/TP operating environments. The price is $25,000 from SBS, 2067 Broadway, New York, N.Y. 10023.

Four-Function 'Utilities/38' Announced for System/38

RUTHERFORD, N.J. — Software Plus, Inc. has announced the release of Utilities/38, a four-function utilities package for the IBM System/38.

The package includes Menu Management (MM/38), Value Display Utility (VDU/38), Financial Analysis Utility (FA/38) and Graphics Utility (Graph/38).

According to the vendor, MM/38 relieves the data processing department of the programming required to set up individual user menus. User menus can be tailored in more detail and with less effort. The cost is $2,000.

VDU/38 provides data processing departments with the ability to define associated value to data and eliminates external editing requirements. It is priced at $1,750.

Using income statement and balance sheet information, FA/38 automatically generates four major financial reports, including source and use of funds, financial trend analysis, common size analysis and Dun & Bradstreet Corp. Key Business Ratios. The cost is $850.

With Graph/38, standard formats of information can be transformed into graphics displays. It will illustrate these values as well as report the sales results in numerical terms, the vendor said. It is priced at $500.

The price for all four packages is $3,800. More information is available from Software Plus, Meadows Office Complex 301, Rt. 17 N., Rutherford, N.J. 07070.

Relate/3000 Enhanced For HP 3000

SANTA CLARA, Calif. — CRI has introduced a menu system enhancement to Relate/3000, a relational data base management system for Hewlett-Packard Co. HP 3000 series computers.

The fill-in-the-blank menu system uses a front-end facility that allows novice users to create and manipulate data bases, create custom reports and generate color graphics and plots, a spokesman said.

Each menu provides the user with complete instructions and a self-guiding layout. Utilizing true character mode I/O, only the characters that need to be processed are processed.

The menu system operates with Relate/3000 Version 4.30 on all HP 3000 series computers under the MPE operating system. Relate/3000 is available for purchase starting at $9,950; the menu system is listed at an introductory price of $3,500 through November.

Thirty-day product evaluations are available from the vendor. More information is available from CRI, 5333 Betsy Ross Drive, Santa Clara, Calif. 95054.

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Provides CICS Attachment

Enhanced Help Facility Unveiled

TORRANCE, Calif. — Data 21 has announced a new version of its on-line help facility development and processing system known as Help Display Facility (HDF) 1.2. The system reportedly provides for the programmerless on-line, real-time creation and maintenance of multilevel on-line help facilities which can be attached to IBM CICS applications, accessed on-line with the HDF display function and printed in manual form.

At the same time, Data 21 also announced the Remote Print Facility-Extended (RPF-E) 1.3, a CICS spooling system for users of IBM's DOS/VSE operating system.

Version 1.2 of the HDF allows the user to define HDF command characters from any character on the user's keyboard. In addition, Data 21 has extended its variable substitution processing to include the Terminal Control Table User Area, which can be defined to HDF while variable names can be employed on help screens, a spokesman for the company explained. These names are replaced with the variable data they represent whenever the HDF screen is displayed.

In Version 1.3 of RPF-E, a batch interface to the Vsam ESDS spool file complements the RPF-E on-line interface. Batch programs can write reports directly to RPF-E bypassing IBM's Power/VSE, or a batch copy utility can be run to transfer reports from Power/VSE to RPF-E. Coupled with RPF-E's hot printer support, batch as well as on-line programs can have output automatically routed to CICS printers, or the output can be retrieved at the user's discretion, the spokesman said.

Reports can be routed to an IBM Personal Computer's disk for off-line printing or directly to the Personal Computer's printer. Also, data in the Personal Computer can be uploaded to the host system with RPF-E.

Help Display Facility 1.2 is available at the introductory license fee of $1,050, while the Remote Print Facility-Extended 1.3 costs $4,200. Data 21 is located at Suite 300-5, 3868 Carson, Torrance, Calif. 90503.

On-Line Protection System Debuts for CICS Level 1.4

NEW YORK — Cornell Computer Corp. has introduced a computer on-line protection system designed for IBM CICS Level 1.4 or higher.

Aegis controls access to accounting and financial files, customer lists and employee records, a spokesman said. It also controls which operators and terminals may access specific files and programs. The hours and days that operators and terminals are permitted to enter the system are predetermined by the manager of computer security.

Each operator is assigned a password, and no one can sign on without it. The security manager determines which files and programs each operator will be permitted to use and to what data each terminal will have access.

The system features formatted security, a sign-on screen with darkened password field, save and restore functions, automatic sign-off interval for each terminal and a log of all maintenance activities.

Aegis is designed so that all unsuccessful attempts at sign-on at a particular time are recorded by names and passwords, as well as the times and locations of such attempts.

Aegis is sold at a one-time price of $17,500 with discounts for multiple sites or CPUs. A maintenance contract is available for $1,750 for one year or $3,000 for two years. Under the maintenance agreement, all future enhancements are provided at no cost, and the warranty is extended for the full term of the agreement. Cornell Computer is located at 363 Seventh Avenue, New York, N.Y. 10001.

Data Utility Announced For Wang VS

WHEATON, Ill. — Generated Systems, Inc. has announced Dataryte IV, a data validation utility for the Wang Laboratories, Inc. VS Minicomputer.

According to the company, the system is designed to interface with the data entry programs created by Wang's EZFormat utility. The package is said to store edit rules on an edit tape file, not embedded in program logic, so nontechnical personnel can make changes to edit rules. This approach is said to reduce the complexity of data entry programs, standardize and centralize edit control and allow the users direct access to the validation process.

Dataryte was established for on-line use, but can also be used in a batch run. It can be utilized for mass change or simple report generation in a batch mode, the company said. The system is said to allow users to examine each field within a transaction or record and report exceptions, deviations or omissions, and users can test for an unlimited number of specific values and/or ranges of values.

The system is written primarily in Cobol with two small assembler subroutines. It is priced at $3,000 for a single CPU, with multiple CPU discounts available from Generated Systems, 209 N. Hale St., Wheaton, Ill. 60187.

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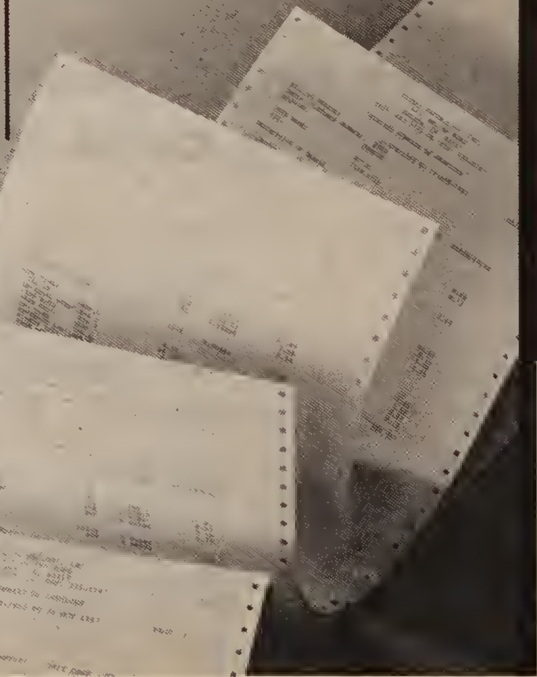

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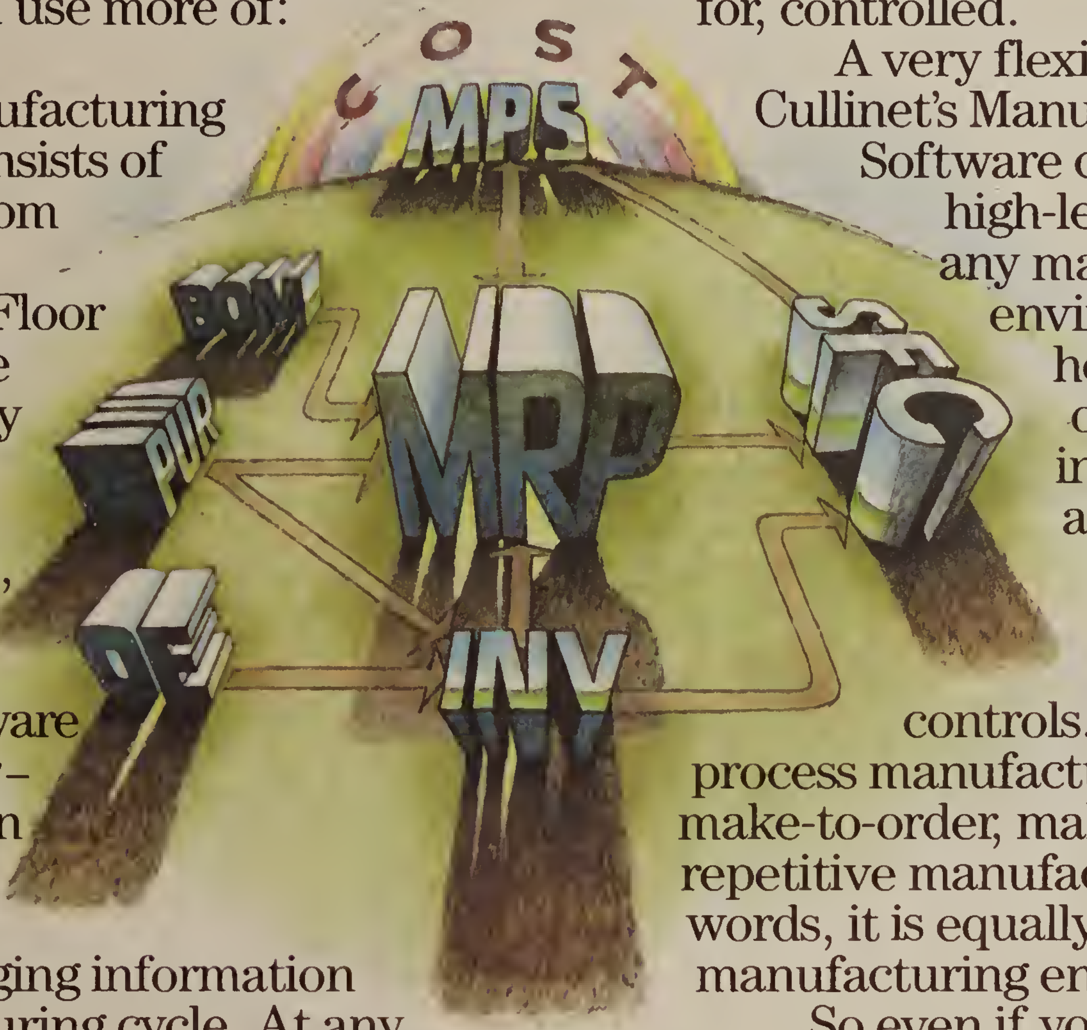

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'Arsap' Management System Updated to Run on PDP-11s

RIVERDALE, Md. — Arsap, the resource management and chargeback system for Digital Equipment Corp. computers from Gejac, Inc., has been updated to run on PDP-11s using the recently released RSX-11M 4.1 operating system.

Arsap is a computer resource management system that provides users with reports on various aspects of data center operations. Available for use with other DEC operating systems including RSTS, RSX-11M, RSX-11M-Plus and VAX/VMS, Arsap can be used to compare resource utilization in shops with multiple operating systems, a Gejac spokesman said.

With Arsap, users can be prompted for a project-identification and password upon logon, and the terminal session can be allocated to a specific project and account. System utilization reports can be generated for each terminal, showing the activity on each terminal, when the terminal is used and the amount and type of resources consumed. The reports are presented in graphics as well as numeric format, the company said.

In addition, utilization reports can be produced by shift and may include such information as CPU usage, disk space, number of logons, connect time, memory utilization and device I/Os. Invoicing can be generated by user or by project.

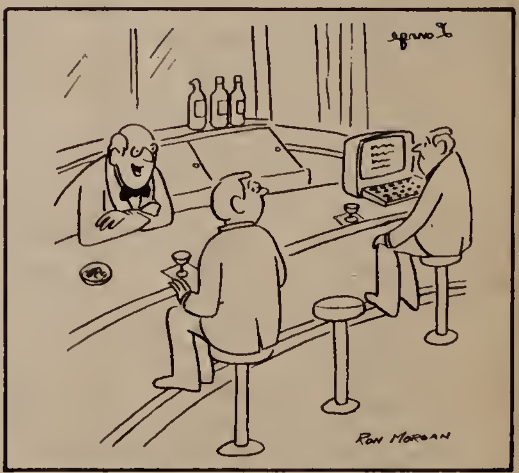
Arsap for RSX-11M is available for a one-time license fee of $2,995. Existing Arsap for RSX-11M users who are under Gejac's maintenance and enhancements service may receive the updated version at no charge. Arsap users not under the service can purchase the update for $1,198 from Gejac through P.O. Box 188, Riverdale, Md. 20737.

Buffer Control Of Computronics Targets Prime

WOOD DALE, Ill. — Computronics has announced Input Buffer Control software, which is said to provide a buffer-control capability for data coming into a Prime Computer, Inc. system on any asynchronous communications line.

The software is useful for connecting Prime computer systems to microcomputers, local-area networks or other high-speed equipment, and the system is said to resolve the difficulties that these devices can cause when sending data faster than the Prime system can accept it, a spokesman said. A program is provided that allows the system manager to control the buffer thresholds when the software decides that the buffer is nearly full or empty. The buffer-control feature can be enabled or disabled on a line-by-line basis.

The system is available for all Prime 50 series systems and will also work on the Prime 400 and 500. The package is priced at $600, including a one-year warranty and all new releases. Information is available from Computronics, 130 N. Ash, Wood Dale, Ill. 60191.



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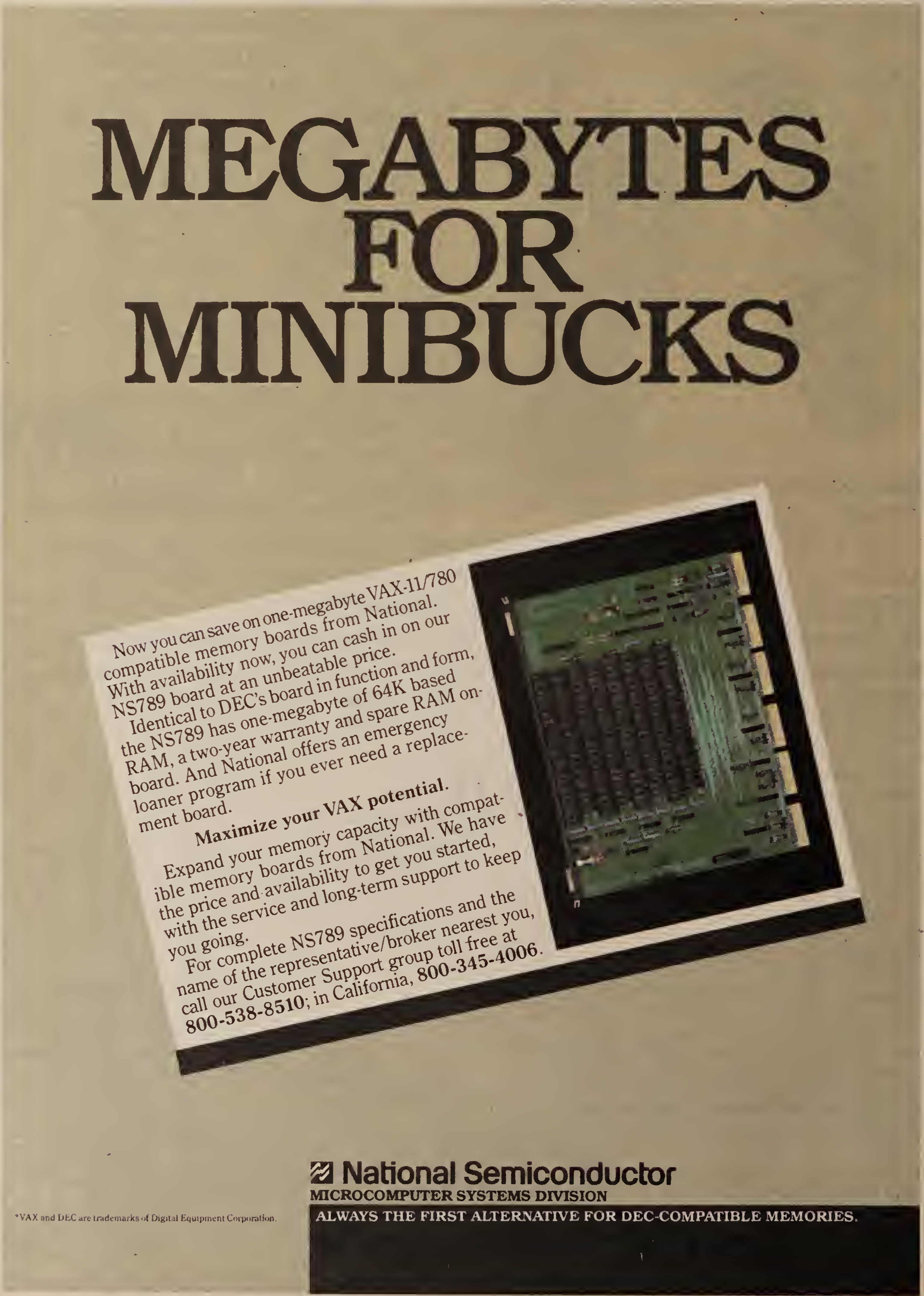
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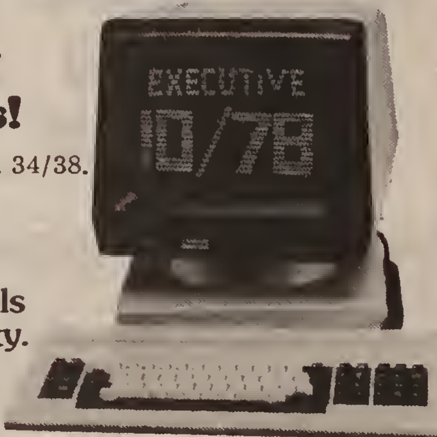

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Firm Offers Service to Test Integrity of Banks' Systems

ATLANTA — Computer Based Solutions, Inc. has announced Data Security Test to test the integrity of bank computer systems against crime.

The service includes direct consultant time and use of a survey, which includes direct as well as peripheral considerations in measuring the protection of a computer system. Specifically, it covers software (applications, systems and security), host computers, satellite computers, micros, terminals, automatic teller machine passwords, data communications, wire transfers, employee background investigations, DP auditing, documentation, training, disaster recovery planning, physical security, encryption, manual procedures, library procedures, management involvement and organization structure, according to the vendor.

The service costs $10,000.

Further information is available from Computer Based Solutions, Suite 1148, 3390 Peachtree Road N.E., Atlanta, Ga. 30326.

Multitask Aims Accounting Tool At Leasing Use

WELLESLEY, Mass. — Multitasking Systems, Inc. has introduced Flexx, an accounting management system geared to the leasing industry.

Flexx performs accounting and financial functions in the areas of fixed asset accounting, general ledger, accounts payable and receivable, payroll, time accounting and credit applications, according to the vendor.

The system does not require learning another language, and each operator can create his own program, the vendor said.

Flex runs under Data General Corp.'s DOS and EOS; Digital Equipment Corp.'s VMS; Wang Laboratories, Inc.'s VS; and Point 4 Data Corp.'s Iris operating systems.

The price ranges from $21,000 to $95,000.

Further information is available from Multitasking Systems at Suite 301, 177 Worcester St., Wellesley, Mass. 02181.

ICP Announces Directories

INDIANAPOLIS — International Computer Programs, Inc. (ICP) recently announced a series of software directories that concentrate on individual business categories.

The six volumes of ICP Software Directories concentrate on banking, business planning, financial services, graphics, insurance and office automation.

ICP also announced ICP Quicksearch, a 24-hour hot line to ICP's data base of software products, service and vendor information.

The directories are sold separately, ranging from $19 each. Further information is available from International Computer Programs, 9000 Keystone Crossing, P.O. Box 40946, Indianapolis, Ind. 46240.

Nasa Unit Offers Archival System

ATHENS, Ga. — Cosmic, the software dissemination center of the National Aeronautics and Space Administration (Nasa), has released the Arch file archival system, which is said to provide for off-line storage and retrieval of arbitrary files on a Digital Equipment Corp. VAX-11 system.

According to Cosmic, Arch can handle any one of the three types of Files-11 formats: indexed, sequential and relative.

The user can add comments to explain actions and maintain file history.

The package is said to offer several features which aid the user in searching the archived file to eliminate dearchiving to locate a specific file.

An internal Help facility provides assistance in all phases of the Arch system, according to the vendor.

Arch is said to incorporate privileged management functions, including commands that initialize or restore the special disk directory, recalculate the index of files and locate files in the disk directory which are not known to the system.

Arch source code is available for $975.

Further information is available from Cosmic at 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

Report Writer Fits VAX-11

SUNNYVALE, Calif. — NCA Corp. has announced the availablity of the Fast Inquiry System (FIS), an interactive report writer, for its Maxcim system on Digital Equipment Corp.'s VAX-11 series of computers.

Maxcim is an integrated manufacturing/financial software system for the planning, analysis and control of manufacturing operations.

It runs on DEC VAX-11 and PDP-11 computers, according to the vendor. FIS is an addition to the existing Inquiry function and decision support system for management reporting.

FIS is integrated as a function on Maxcim's 'X' menu.

Additional features of FIS include a full command-file interface facility, format control and an on-line calculation capability (including subtotals and totals).

FIS is available for $4,000 from NCA, 388 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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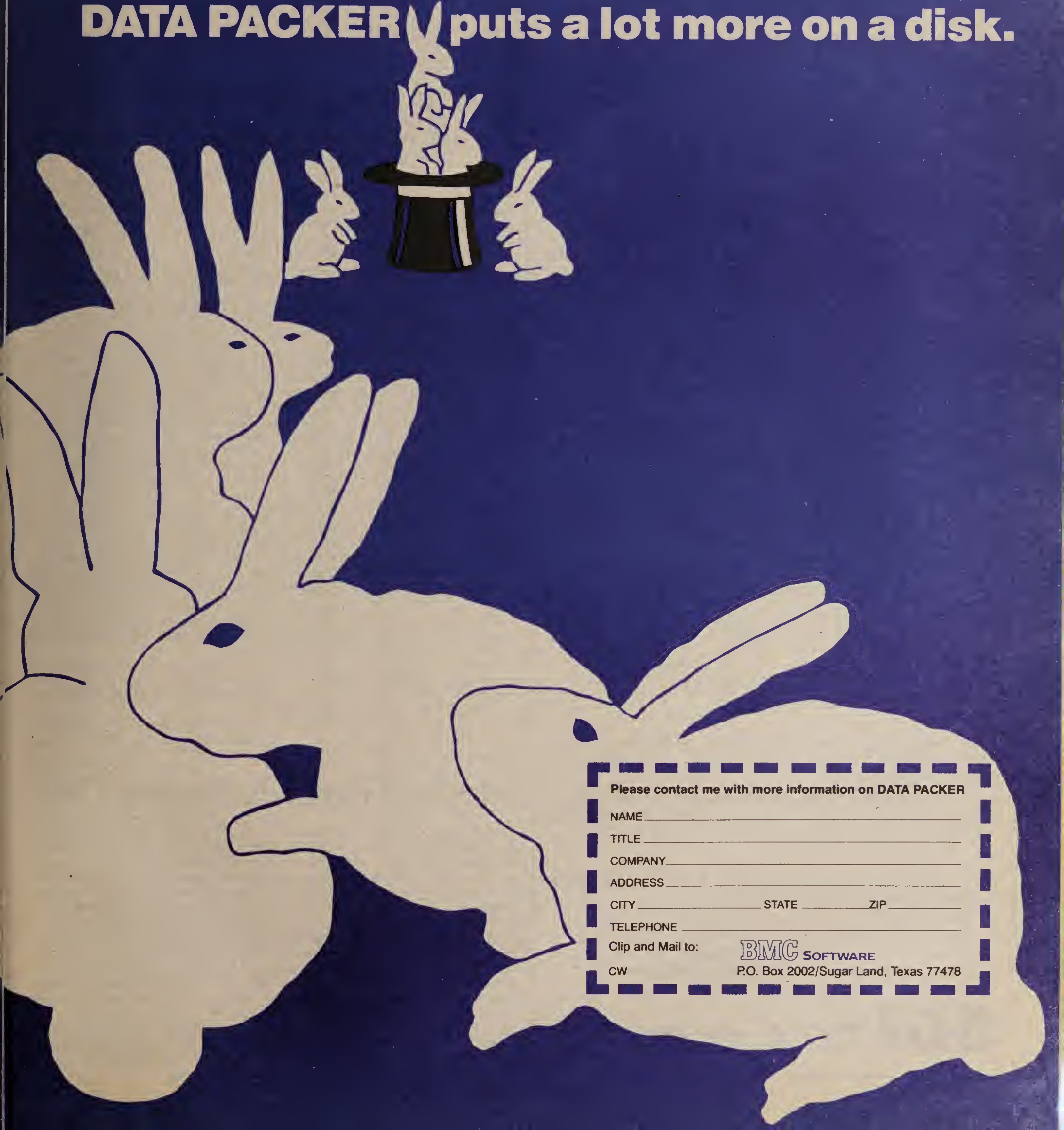

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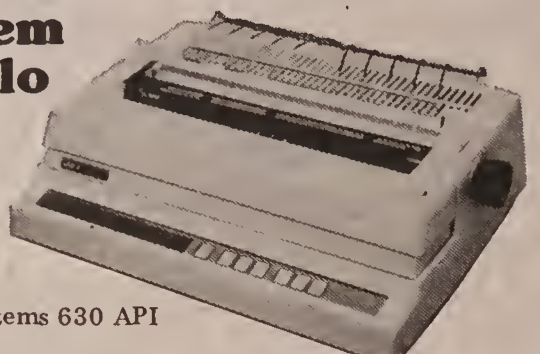

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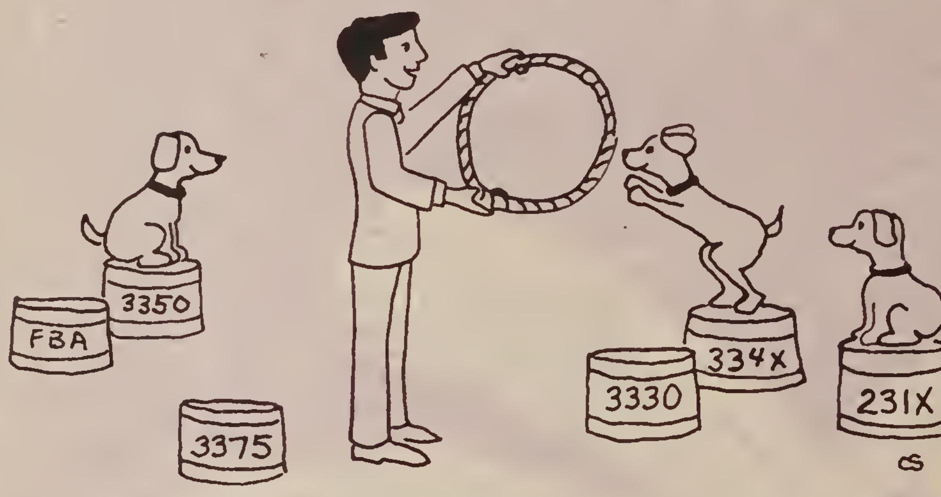

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HCGS Joins DEC Terminals With Tektronix Software

BURLINGTON, Mass. — Texprint, Inc. has announced Host Computer Graphics Software (HCGS),which the company said makes software written for Tektronix, Inc. Plot 10, 4010 and 4014 graphics usable on Digital Eqipment Corp.'s dot-matrix printer/plotter terminals.

The company said HCGS provides low-cost, high-resolution color hard-copy output of charts, diagrams, maps, formatted reports, and other text and graphics data. It is said to eliminate the requirement of reprogramming software written for Tektronix systems into a DEC-compatible bit-map graphics structure by allowing Plot 10, 4010 and 4014 call-type applications to produce color text and graphics hard copy on the Decolor LA 120, and in black-and-white on Decplot and other DEC dot-matrix printer/plotters.

It is written in Fortran and is supplied in source form for DEC computer systems or any Ansi- or Ascii-compatible system running Fortran.

HCGS kits are available at $895 for color and $795 for black-and-white from Texprint, 8 Blanchard Road, Burlington, Mass. 01803.

Micro-Based Programs Offer Management Training

COCONUT GROVE, Fla. — Thoughtware, Inc. has announced the first in a series of personal computer-based learning programs called Thoughtware.

Thoughtware offers professional management training on a personal computer.

The program is said to combine paper-based and audiovisual instruction courses with computer-aided instruction.

Thoughtware is programmed for use with the IBM Personal Computer and hard disk XT models and employs an authoring language called Alice (Authoring Language for Interactive Computer-based Education), which enables users to design programs without familiarity with complex programming languages, according to the vendor.

The system incorporates color graphics and animation and is interactive with a built-in assessment capacity that allows each individual to compare performance with national norms, according to a vendor spokesman.

The first two series to be introduced will be Management Diagnostics and Management Training, each designed for either individual or group use by managers at all levels, the vendor said.

Thoughtware is said to apply generic management training to real-life situations.

The programs are priced from $350 to $450 each, according to the vendor.

Thoughtware is located at Suite 1000A, 2699 S. Bayshore Drive, Coconut Grove, Fla. 33133.

Classes Aimed At IBM Users

RUTHERFORD, N.J. — Software Plus, Inc. has announced two 10-week classes this fall for beginning and advanced users of the IBM System/3, System/34 and System/38.

The classes, which cost $750 for registration and books, will be taught at the Software Plus office at the Meadows Office Complex in Rutherford, N.J., according to the vendor.

"Inside the System/38," the introductory course, will run Nov. 8 through Jan. 17.

The course is said to concentrate on establishing a working familiarity with the System/38 through hands-on experience.

The advanced class will run from Nov. 10 through Jan. 19, the company said.

The advanced class is designed for users with one to two years System/38 experience, according to the company.

Software Plus is located at Meadows Office Complex, 301 Rt. 17 N., Rutherford, N.J. 07070.

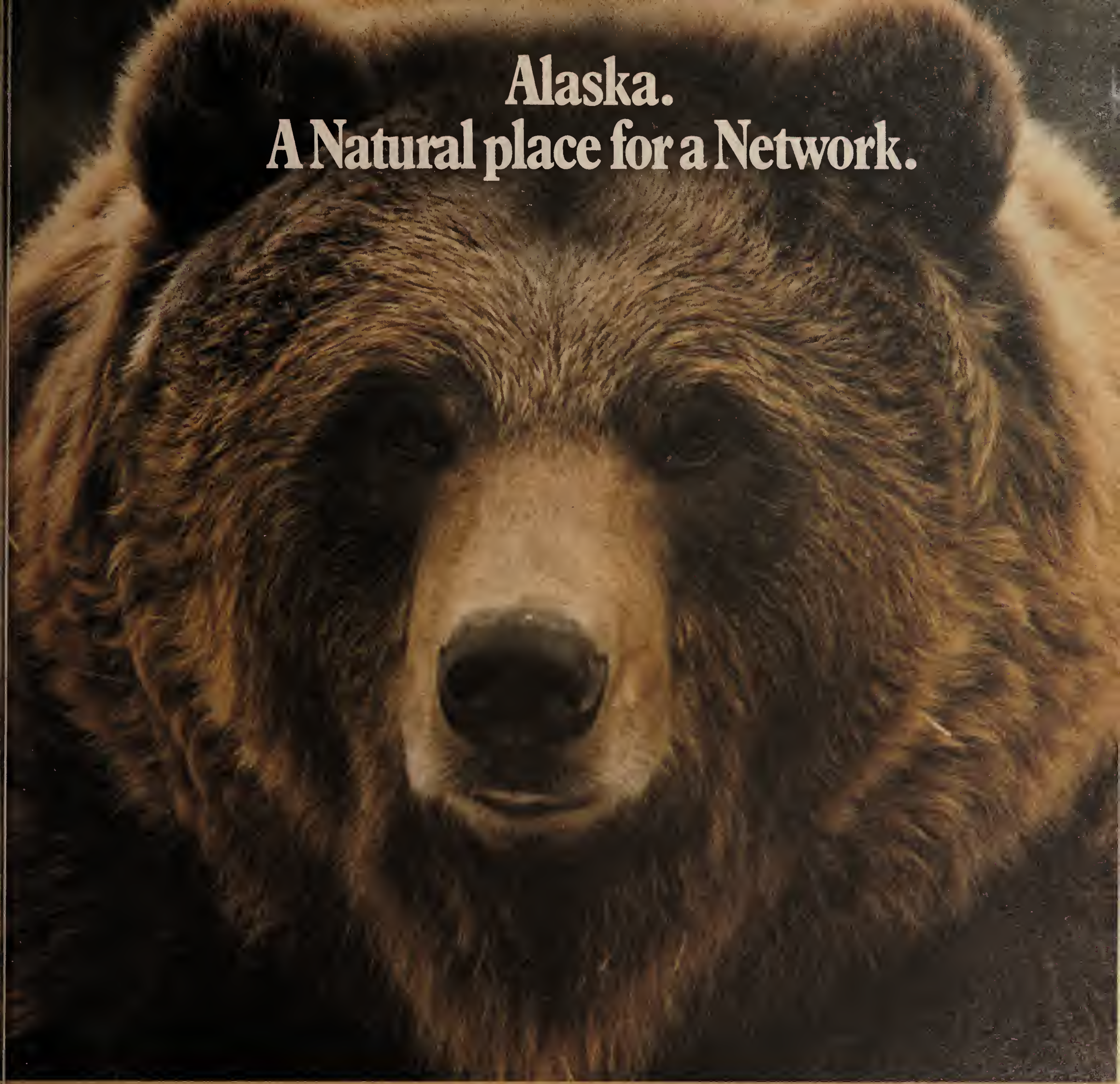
Medical Records System Out

WAUKESHA, Wis. — Computer Resources and Technology, Inc. has introduced Problex, a physician hands-on, problem-oriented medical records software system for use with IBM System/34 and System/36 hardware.

The package is said to organize medical records and eliminate duplication of records entries. It organizes records into easily updated chronological tables of contents/synopsis that can be retrieved in minutes through cross-referenced codes. The company said security features have been included.

The system is said to provide immediate access to patient identification information, present condition and therapies and dates of visits. Printed records such as hospital admissions, medical insurance reports, prescriptions and consultation records can be generated automatically by the computer from the information entered to the medical record. Problex can be integrated with the Medical Billing Management System software system developed by the company.

The package is priced at $12,300 from Computer Resources and Technology, 20100 W. Greenfield, Waukesha, Wis. 53186.



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NATURAL is Software AG's fourth—generation information processing system—a tool that provides the productivity needed in a place where people are the most priceless resource of all. One NATURAL programmer can typically do the work of 10 to 20 COBOL programmers.

NET-WORK is the distributed processing software that allows Alaska's officials to manipulate data from multiple systems hundreds of miles apart—without having to worry about which location has what data.

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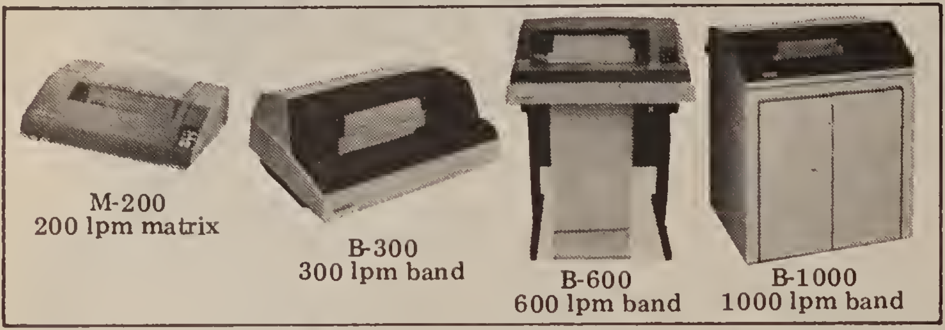

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Data Base System Targets Life Insurance Industry

CHICAGO — Pride-Tech Corp. has announced Life-D/B Insurance System software, a data base system designed for the insurance industry.

The system, which the company said is compatible with any minicomputer or mainframe that supports Cobol, is said to be an integrated data base designed around a high-level language developed by the firm to enable users to install, modify and upgrade the system easily. The system provides processing support for the issuing of new business and the ancillary functions required for submission to in-force policy processing.

The package offers elimination of data redundancy, simplification of data access, full availability of information in report formats, a single master file data storage concept and application processing support modules. The Life-D/B-Insurance System is said to support the following life insurance products: universal life, term, whole life, retired lives reserve, current value assumption products, endowments and fixed and variable annuities.

According to the company, the high-level language — D/B-L — has reduced the need for trained system specialists. The simplicity of the language is said to be in its reduction in the overall code required to make program changes and test them online without interrupting the system.

Life-D/B is priced at $150,000. Further information is available from Pride Tech, Suite 2504, 505 N. Lake Shore Drive, Chicago, Ill. 60611.

Software Plus Offers Package For System/38

RUTHERFORD, N.J. — Software Plus, Inc. has introduced Human Resources/38, its latest applications software package designed specifically for the IBM System/38.

Human Resources/38 has six modules. The functions include:

- Applicant Tracking — Equal Employment Opportunity (EEO) information, applicant profile, job title and interview data.
- Personnel Demographics — employee roster, employee profile, EEO reports, turnover analysis, holiday and vacation schedules and termination roster.
- Benefits Reporting — insurance premium analysis, internal pension reporting, dependent tracking, thrift plan reporting and eligibility roster.
- Compensation Reporting — salary administration, salary reporting, job evaluation records and performance appraisals.
- Administrative Reports — manpower reporting, budget comparisons, salary comparisons, current retirees and pension census.
- Fleet System — lease expense analysis, lease payment analysis, expense records and insurance data.

According to the vendor, the program allows human resource managers to use terminology with which they are familiar. The system has built-in security features, yet allows users to design their own security.

The Human Resources/38 currently offers 60 reports but has the capability to expand beyond that to meet user needs.

The system is priced at $30,000 from Software Plus at 301 Rt. 17 N., Rutherford, N.J. 07070.

RCA Introduces News Service To Telex Users

NEW YORK — RCA Global Communications, Inc. has introduced its own news and information services for U.S. and overseas telex customers.

Hotline offers world news and stock quotations. Reports from major financial centers around the world — including Zurich, London, Sydney and Frankfurt — form the basis for the financial information.

The service is the result of an agreement reached with the Associated Press (AP), which will provide and constantly update the information. Based on the system's use, AP provides additional sections of information and special interest articles.

Through a separate agreement with Bunker Ramo Corp., stock quotations are available. The cost of the service is the price of a telex, a spokesman said.

More information is available from RCA Global Communications at 60 Broad St., New York, N.Y. 10004.

Integration Tool For SB-5 Bows

ELMWOOD PARK, N.J. — Business Controls Corp. (BCC) has developed an optional software module to integrate its SB-5 automated Cobol software development system with the System 1022 data base management system (DBMS) from Software House, Inc.

With the integration module installed, SB-5 automatically accesses the System 1022 data base as required for new program development and program maintenance. Subroutine calls and working storage section definitions are correctly generated automatically, a spokesman said.

The System 1022 DBMS is used with Digital Equipment Corp.'s Decsystem-10 and -20 mainframe computer systems. Versions of SB-5 are available for DEC's PDP-11 and VAX minicomputers as well as for the mainframes.

The price for SB-5 without an integration module ranges from $12,000 to $32,000 depending on the target computer system. The SB-5/1022 Integration Module option is priced at $5,000.

Further information is available from BCC, 507 Boulevard, Elmwood Park, N.Y. 07407.

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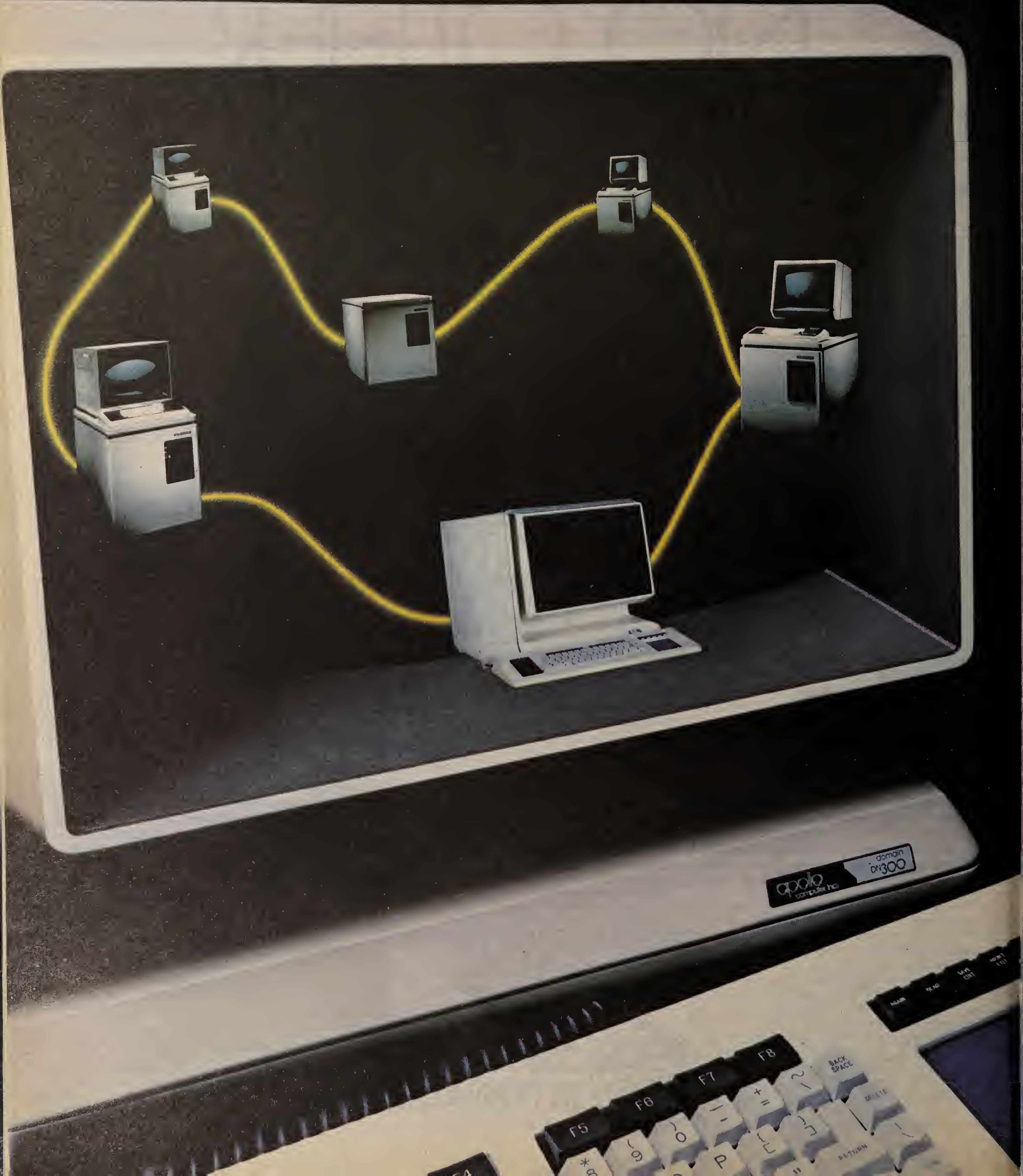

the $10,000 desktop mainframe.

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In a unit that takes no more space than a daily newspaper, the DN300 gives you a high performance, 32-bit virtual memory processor, high-resolution bit map graphics, and an integrated local area network that provides network-wide virtual memory access.

The DN300, latest in the family of DOMAIN processing nodes, supports up to 1.5 million bytes of main memory and 15 concurrent processes of 16 million bytes each, so you can execute large programs. Its 17-inch 1024 x 800 pixel landscape display provides the high-resolution graphics you need for technical applications. The 12 million bit-per-second high speed token-passing network lets you access data anywhere in the network without sacrificing performance. And the DN300 is supported by an optional local hard disk as well as a full complement of network peripherals and gateways.

The DN300 is fully compatible with Apollo's DN400, DN420, and DN600 color computational nodes and supports the same multiprogramming environment, large virtual address space, network communications, multi-window display management, and extensive command library as other DOMAIN nodes. The DN300 connects directly and easily to any new or existing Apollo DOMAIN network. Or it can be used as a standalone workstation. Which means that you can configure the type of network that exactly suits your staff and working environment.

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Standard with every DN300 node is AEGIS, the only network-wide virtual memory operating system available today.

Optional software includes ANSI-standard FORTRAN 77, Pascal, C, SIGGRAPH Core Graphics Library, X.25, IBM HASP, IBM 3270, D3M distributed database management system and AUX, a software environment based on UNIX™ System III.

More than 50 available third party application software packages include MSC/NASTRAN and ANSYS, two highly regarded finite element analysis programs; PATRAN-G, an interactive finite element pre- and post-processor; SCRIBE, a text formatting and document production system; and DISSPLA and TELL-A-GRAF, the leading data representation graphics software packages.

NEW DOMAIN SERVER PROCESSOR—A LOW COST WAY TO HANDLE NETWORK PERIPHERALS AND GATEWAYS.

The new DSP80, an intelligent peripheral server that connects to the Apollo DOMAIN network, lets users freely share the same, centrally located peripherals. That relieves individual nodes of the burden of peripheral support. So nodes have more time and more power available to handle specific application-related computing.

And you save money by sharing your expensive peripherals—disks, tape drives, printers and plotters. The DSP80 also provides every user with access to specialized services such as communication gateways, large-scale file storage, and print/plot spooling.

USA price $9,933, system builder, quantity 35 DN300 with .5Mb memory, 17-inch graphics display, network interface, and AEGIS operating system.

UNIX is a trademark of Bell Laboratories.

ANSYS is a registered trademark of Swanson Analysis Systems, Inc.

DISSPLA and TELL-A-GRAF are registered trademarks of Integrated Software Systems Corporation

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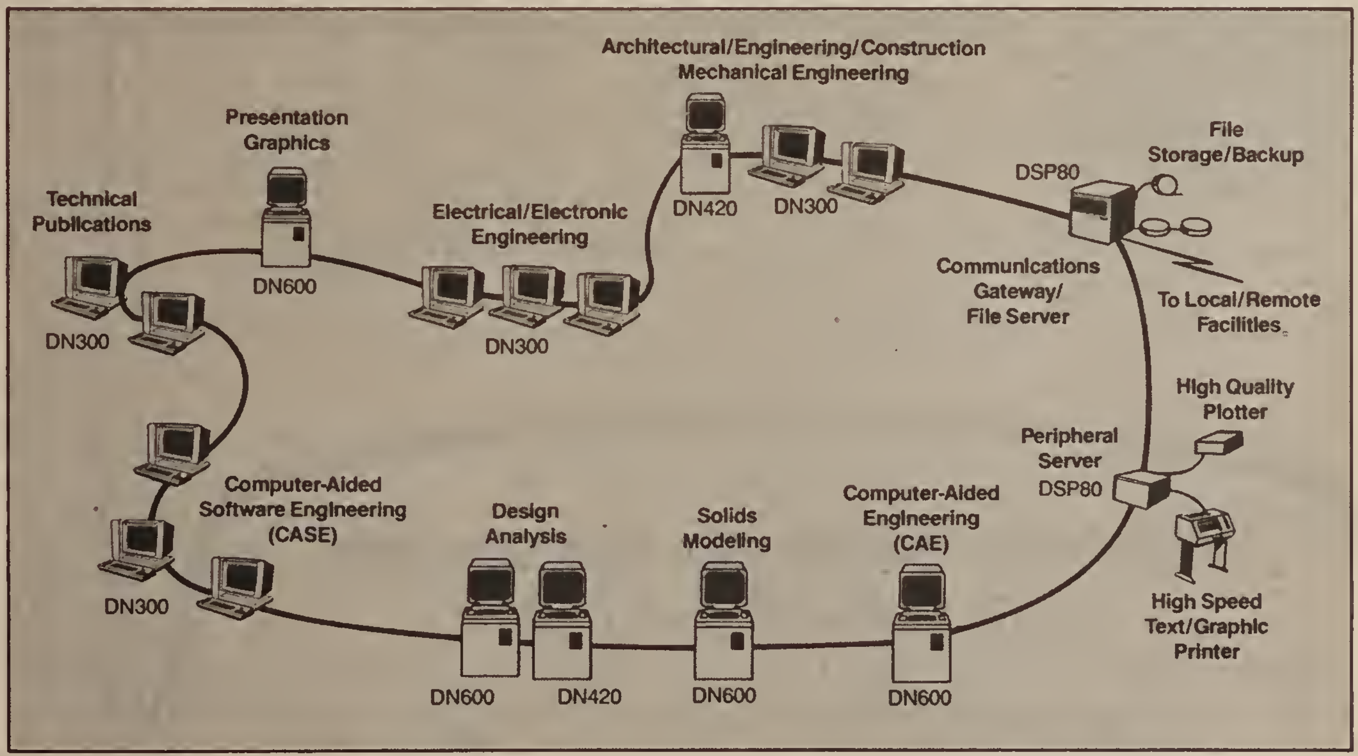
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Micro Notes

Version 1.1 of **Number Cruncher** for the IBM Personal Computer, XT and compatible microcomputers includes a data base management system, information management, text editing, applications generation and spreadsheet functions and is priced at $395. A paycheck-preparer module is priced at $89.95 and is also available through Pyramid Data Ltd., P.O. Box 10116, Santa Ana, Calif. 92711.

Datacure, a utility program for microcomputers running Digital Research, Inc.'s CP/M 2.2 and Pickles & Trout, Inc.'s V2.2E operating systems, rebuilds files on diskettes that have gone bad. Priced from $99, the program is available from Colorado Online Systems, Inc., 40 Balfour Lane, Ramsey, N.J. 07446.

An advanced management decision simulation program emphasizing business use of personal computers has been released for use on Osborne Computer Corp.'s Osborne 1 and IBM's Personal Computer. Each round of the **Desim/2** program involves as many as 65 decisions related to marketing, production and financing. The program is priced at $12,000, and more information is available from Trans-Global Management Systems, Inc., 73 Columbia Road, Arlington, Mass. 02174.

The **R:Base Series** 4000 is said to be a relational data base management system that can interface with mainframe data bases, Microsoft Corp.'s Multiplan, Ashton-Tate's Dbase II and is compatible with Lotus Development Corp.'s Lotus 1-2-3, Visicorp.'s Visicalc and Micropro International Corp.'s Wordstar. It requires 265K bytes of memory and operates on IBM's PC-DOS; Microsoft's MS-DOS; Convergent Technologies, Inc.'s Ctos; Burroughs Computer Corp.'s Btos; and Unix. It is priced at $495, and an extended report writer is also available at $150 from Microrim, Inc., 1750 112th Ave., N.E., Bellevue, Wash. 98004.

Lantech Systems, Inc. has released **Unetix**, a multitask operating system compatible with Unix. Stand-alone and networking versions of the package are available for Intel Corp. 8086 or 8088-based micros, including IBM's Personal Computer. The stand-alone version includes a Microsoft, Inc. MS-DOS emulator. The first networking version is a distributed file system; a virtual file system for very large network installations is due by the end of the year. Unetix costs $99 from the vendor at 9635 Wendell Road, Dallas, Texas 75243.

Visicalc IV, by Visicorp, combines in one package standard Visicalc along with graphics, sorting, spreadsheet management and user-defined commands. The program runs on IBM's Personal Computer. It sells for $250 from 2895 Zanker Road, San Jose, Calif. 95134.

Personal Bibliographic Software, Inc. has developed a word processing and data base program for compiling formatted bibliographies. The **Personal Bibliographic System** was developed by Victor Rosenberg, associate professor of library science at the University of Michigan. It is priced at $250 from the vendor through P.O. Box 4250, Ann Arbor, Mich. 48106.

The Small Computer Co., Inc. has introduced an add-on package, named **Smallware**, for the data base manager it created for Radio Shack. The package is made up of four programs, each sold separately. "Forms," selling for $125, prepares invoices. "Transfer" relays programs and data; it is priced at $150 for transfers between computers with the same size diskette or at $200 between computers with 5¼ and 8-in. diskettes. "Archives," available for $150, removes inactive records and transfers them. "Prosort," also costing $150, selects and sorts records. The package can be obtained from the vendor at 230 W. 41st St., New York, N.Y. 10036,

GM Enterprises, Inc. has put on the market a word processing program for the Basis 108 computer. Entitled **Word Palette**, the software will perform mass mailings and labelings in addition to text-editing functions. It will edit nine pages of text at a time. It lists for $250 from the vendor at 10404 Carryback Circle, Dallas, Texas 75229.

Intesoft, a series of integrated decision-support programs from Schuchardt Software Systems, Inc., is designed for the IBM Personal Computer and compatible machinery. The software is said to allow first-time users to build their own business programs. The series is made up of five products: a relational data base management system; an interactive applications generator; a financial spreadsheet; a time-and-records manager; and a job scheduling, resource allocation program. Each product can be bought separately. The entire series costs $1,329 from the vendor at 515 Northgate Drive, San Rafael, Calif. 94903.

Peachtree Software, Inc. has repackaged its **Business Graphics System** for the IBM Personal Computer and Zenith Data Systems Corp. Z-100 micro. The program has also been revised to include full-color documentation with a tutorial, reference guide, installation booklet and reference card. It retails for $295 from the vendor at 3445 Peachtree Road N.E., 8th Floor, Atlanta, Ga. 30326.

Fox & Geller, Inc. has published a stand-alone graphics program called **Grafox** for the IBM Personal Computer. The full-color software draws information from any Basic file or via the data interchange format. It requires single-keystroke commands to produce bar, pie, pie-bar and line charts. Selling for $295, the product can be obtained from the vendor at 604 Market St., Elmwood Park, N.J. 07407.

The Information People have introduced the **Disc Jockey**, a disk file management system for Organizer II, the company's operator interface and menu generator. The new module helps the user catalog his disk and copy, move, erase and rename files. The system runs under Digital Research, Inc.'s CP/M 80, CP/M 86, MP/M 80 and MP/M 86 operating systems. The price is $149 from 443 Hudson Ave., Newark, Ohio 43055.

Sofstar, Inc. has introduced the **Business Planning Tool** (BPT) to help the user create budgets, forecasts and business plans in the income-statement and balance-sheet format. According to the vendor, the user is not required to learn any programming commands or special symbols.

BPT was designed for the IBM Personal Computer and requires 128K random-access memory and one disk drive. The price is $195, and it is available from 13935 U.S. Highway 1, Juno Beach, Fla. 33408.

The Metasoft Corp. has announced the **Financial Planner**, a three-dimensional spreadsheet, and **Graphics,** a color graphics draw package.

The spreadsheet package allows the user to choose between conventional, wide-document or easy-to-use pages and contains its own programming language. The graphics package will generate pie and bar charts and graphs that can be intermingled with text. The package supports zooming, filling, freehand draw and multiple line choice. Multiple printers and plotters are supported.

Both packages are available for the IBM Personal Computer and Personal Computer XT. Graphics is also available for Victor Business Products, Inc.'s 9000 and Nippon Electric Co. Ltd.'s APC. The Financial Planner costs $395, and Graphics costs $600. Further information is available from Suite E, 711 E. Cottonwood Lane, Casa Grande, Ariz. 85222.

BPI Systems has introduced **General Accounting, Accounts Receivable and Accounts Payable** accounting software for users of Apple Computer, Inc.'s Lisa. Some features of the software include a query or Help screen, BPI's Disk Document Manager and Background printing feature and utilization of Lisa's graphics mouse technology.

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Part Two

Locking Up The Mainframe

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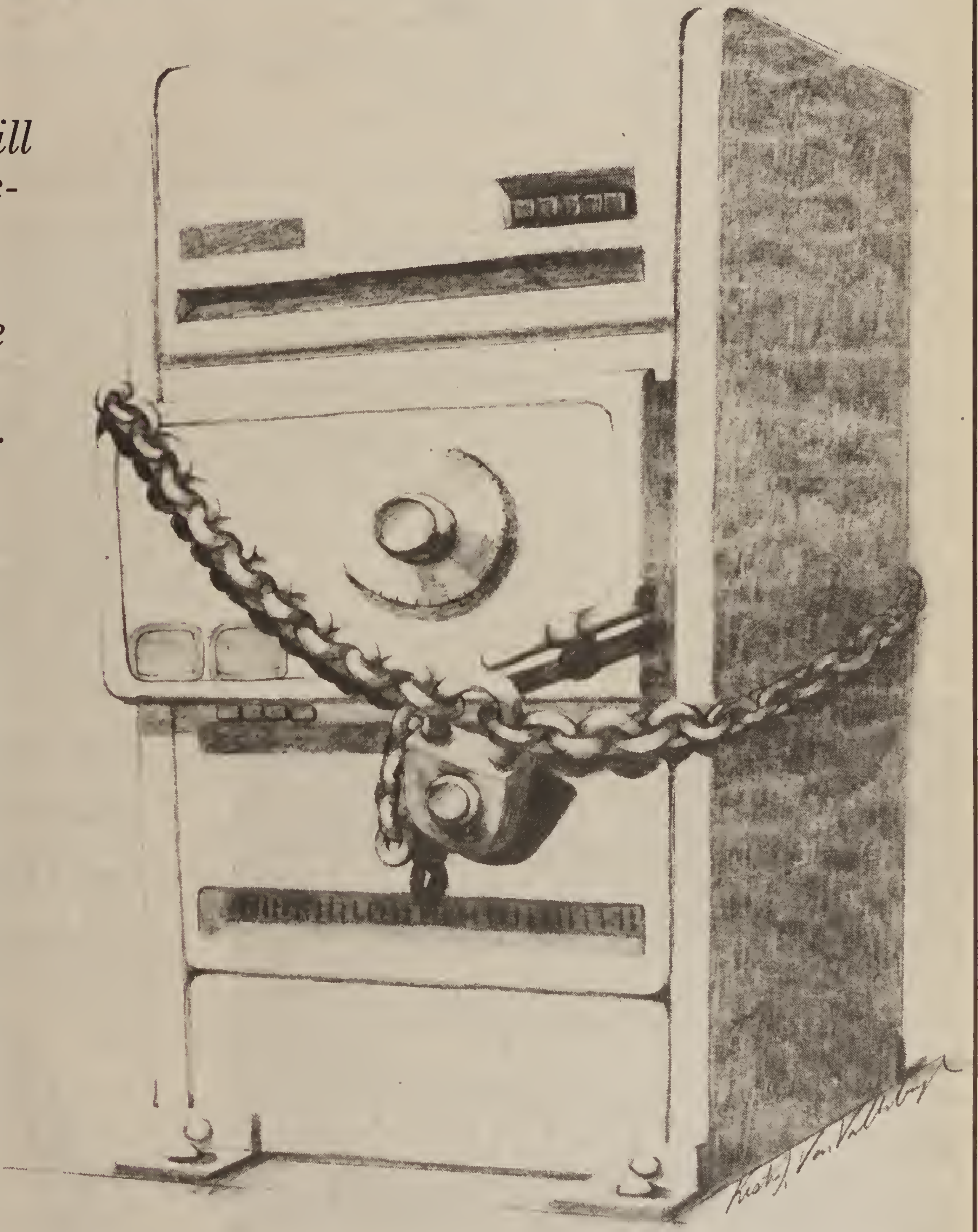

ILLUSTRATION BY KRISTIE VANVALKINBURGH

By Robert P. Campbell

How do we make the transition from today's security environment to the level of capability we want? What is the cycle of change and what are the forces that will bring it about?

In last week's article, we looked at the current state of computer security technology, presented a statement of need and discussed where we are in relation to those needs. This concluding installment will delve into the prognosis — how long it will take to achieve the required level of security and the major influences in this cycle of change.

There are six basic categories of desired capabilities:

Access control. People or objects attempting to access computer systems can be positively or reliably identified.

Process control integrity. Once granted access, people or objects will be restricted to particular functions; separation of users can be reliably assured.

Auditability. Violations of systems security can be detected (real-time or after the fact).

Message confidentiality, integrity. Messages between users and computers can be kept secret and protected against tampering, if necessary.

Tamperproofing. Both the hardware and software can be made tamperproof.

Reliability, survivability. Critical systems and supporting components can be designed so that users will not feel serious effects when those systems are unavailable.

The industry has already invested 15 years in solving security-related problems. The period during which these new security capabilities will evolve may extend another 15 to 20 years.

Estimated development times for improvements in security technology have generally been understated. For example, in the late 1970s, the Department of Defense (DOD) security kernel technology seemed imminent, but except for a few specialized implementations, it has not yet come up to expectations.

The box on In Depth/2 attempts to portray, for each of the requirements, relative progress (on a scale of one to 10) and the number of years remaining to achieve an acceptable level of capability.

Four primary forces will bring about changes in the overall state of security for our systems: the threat environment, legal influences, economic influences and public influences.

We can reasonably expect the threat to sensitive and critical systems to escalate as computer dependence deepens. The more important the functions being automated or supported by automation, the more susceptible these systems will become to abuse and misuse. Two key elements influencing the "threat question" are motivation and opportunity.

	1	2	3	4	5	6	7	8	9	10	Years to Attain
Access Control						X					8-10
Process Control Integrity				X							15-20
Auditability					X						8-10
Message Confidentiality, Integrity							X				5-8
Tamperproofing				X							5-8
Reliability, Survivability					X						8-10

Relative progress (on a scale of one to 10) in computer security.

There is no reliable evidence to indicate that motivation for abuse or misuse of computer systems is increasing significantly, although the moral and ethical implications of recent abuses by youthful hackers should be cause for alarm. Despite ambiguities in the law or lack of understanding of the law regarding electronic etiquette and acceptable behavior, there should be concern about the failure of ethics and morality to blunt this rash of youthful electronic rummaging.

Investigation into the hacker problem shows that publicity and education on the legal and ethical issues of hacking can deter all but the hard-core practitioners. This hard core, however, with its underground organization and zeal for "beating the system," will continue to be a serious threat. In the short term, there is potential for hacking or electronic rummaging to rival the citizens band radio fad of the '70s in intensity.

Hacker response to the 414s has been mixed, showing not only an increased level of apprehension but also a dramatic increase in the number of electronic hacker bulletin boards. Every modem-equipped home computer has the potential to become a bulletin board. The schoolboy rummaging through the electronic pathways takes advantage of opportunity; the hard-core hacker, on the other hand, purposefully goes after particular targets. The 414s generally did not know which systems they had penetrated until after the fact.

"Friendly" systems are heavily dependent upon the proper behavior of system users and operators for security and protection. Large numbers of people have extraordinary or privileged access to sensitive and critical systems, too often without adequate accountability. As these systems become more sensitive and critical and dependency increases, the more frequently we can expect to find people motivated to misuse them in pursuit of personal gain.

Not to be misjudged is the potential for increased criminal activity as that small percentage of the population recognizes the potential for gain. We can expect to see a significant increase in the number of offenders, with decreasing average dollar loss. There will still be individually high losses. Industrial and foreign espionage will increase as technology transfer motivates theft of trade secrets, software and data.

The second element of the equation is the "opportunity" element. As computerization increases, so will the opportunities for abuse — unfortunately, at a much faster rate than the security technology or our application of it. Basic security technology, as well as our ability to implement and enforce adequate control and accountability, lag substantially behind overall systems technology. The more sensitive and critical the functions that are computerized, the more these opportunities will arise.

The bottom line will likely be an escalation of the threat over the next few years. As the use of networking and teleprocessing has increased, hackers are finding ways to weave their way through these networks, getting to the front door and, in some cases, into poorly defended systems. We can expect more sophis-

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ticated attacks against operating systems and internal controls as passwords and other fallible barriers continue to be penetrated and fall short of defensive needs.

This second wave of attack will draw attention to the lack of integrity of internal controls. Major changes to internal control structures, more effective internal separation and compartmentation will be required to counter this type of attack.

The legal aspects of computer security problems will eventually be a strong motivating influence toward developing more secure technology. While most attention is currently being given to the criminal aspects of computer abuses, it is likely that civil action will have an equally important effect on long-term security problems.

Twenty-one states have passed specific computer crime bills directed to the special needs of prosecuting computer abuse and misuse, but there has been no corresponding legislation at the federal level. The Federal Computer Systems Protection Act (currently H.R. 1092), pending for five years, has not yet been passed by Congress. At issue is whether the existing body of law is fully adequate for both the crime and the punishment. At issue also is a potential conflict over jurisdiction between the states and the federal government.

Finally, there are also concerns over the imprecision of the proposed legislation, which fails to define such key terms as "computer." Some observers fear that such imprecision might lead to misapplication or abuse of the legislation itself (for example, to prosecute minor offenses by children).

It is also being argued that the proposed legislation focuses upon the instrument rather than the object of the crime: the computer rather than the information, its tangible and intellectual properties and individual rights. While there is a certain truth to this argument, the body of law regarding information, its sensitivity and value, as well as its intellectual properties, is even less well-defined.

More Prosecutions

Prior to 1982, few states with computer crime laws had exercised them. By this summer, however, substantial numbers of cases were being brought to the state courts, with six cases alone in the county of Los Angeles.

The prosecution and deterrent value of the pending Federal Computer Systems Protection Act will likely cause the legislation to be passed once Congress resolves its definitional, evidentiary and jurisdictional problems. As both the federal government and states develop enhanced investigatory and prosecutorial tools and gain experience with rules of evidence and interpretations by the courts, the initial legislation will be clarified, amended and enhanced.

Twenty-one states have passed laws directed to the special needs of prosecuting computer abuse and misuse, but there has been no corresponding legislation at the federal level. The Federal Computer Systems Protection Act has been pending for five years.

While these issues are being argued, computer abuses, such as the Milwaukee 414s' transgressions, are being tolerated — and, in some cases, almost glorified by the press and in movies. And the courts are handing out light jail sentences. Computer crimes are being looked upon as crimes against large impersonal institutions rather than against individuals, which thus can be easily absolved by the institution.

Popular opinion, it seems, heavily favors man in the man-machine conflict, applying little more than a slap on the hand to offenders. There is also a strong trend developing to

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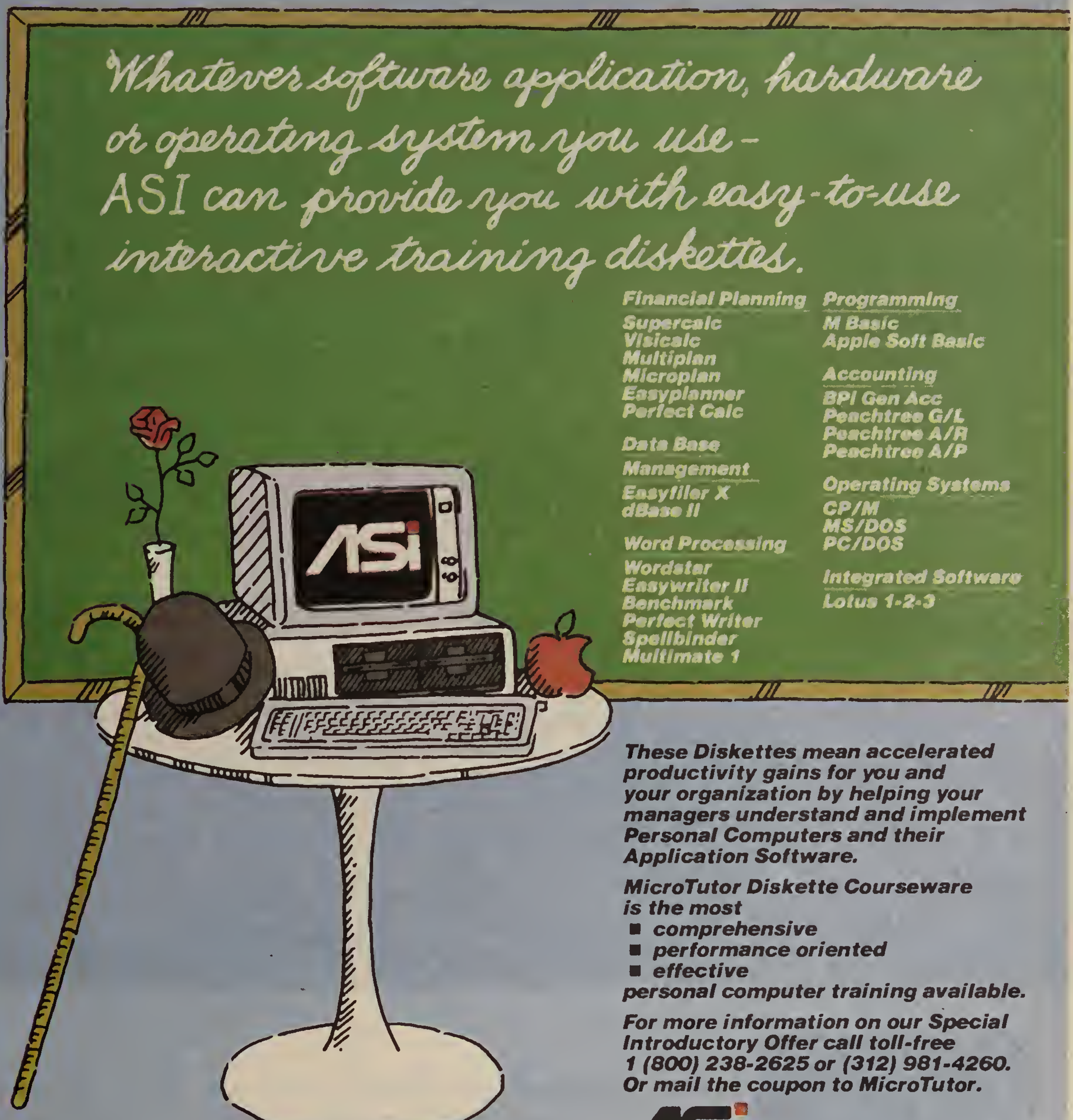

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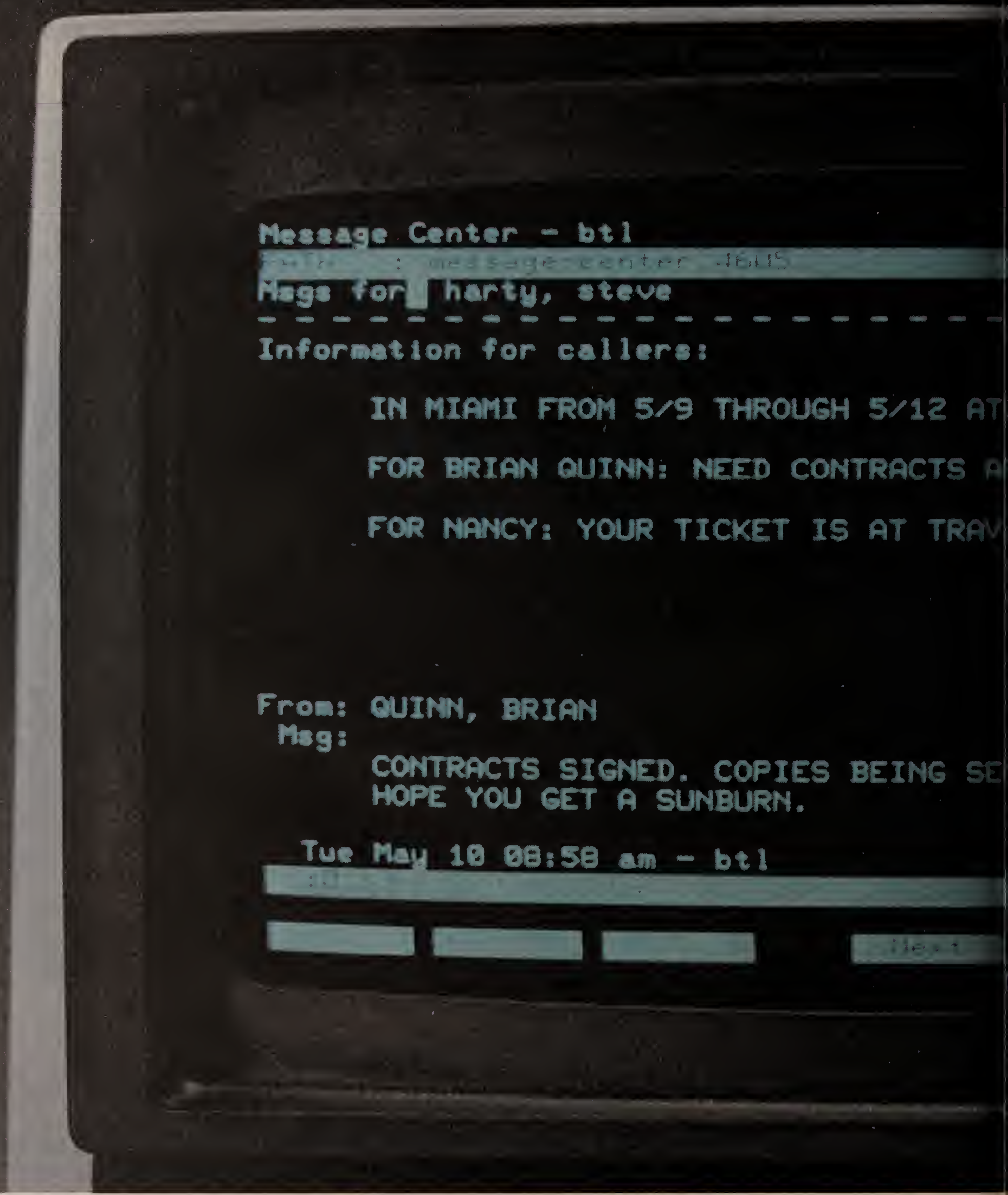

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     FOR NANCY: YOUR TICKET IS AT TRAV



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 Msg:
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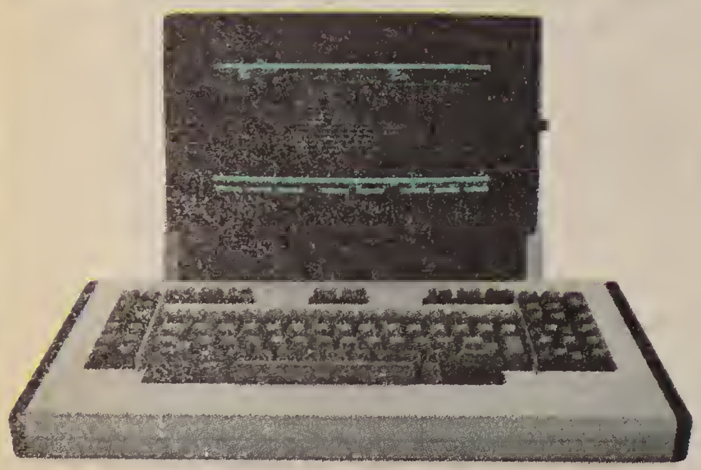

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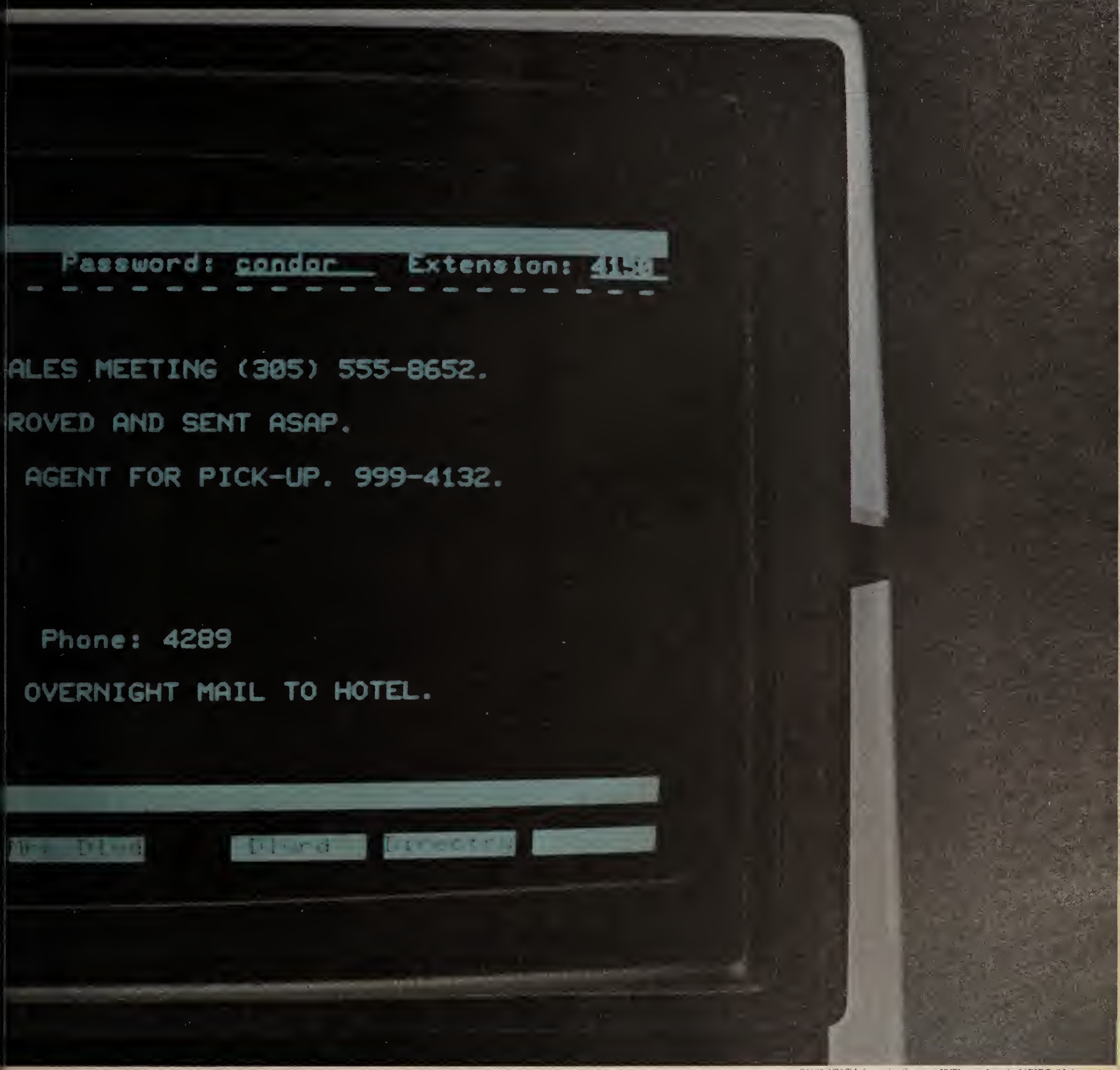

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cover such losses with insurance or — as was the case with retail crime and shoplifting during the '70s — to pass losses on to the consumer as a cost of doing business. These actions both run counter to the need to prevent rather than mitigate the abuse.

Computer crime laws will also draw attention to the civil or liability aspects of computer insecurities. We can expect to see individual and/or class-action suits. For example, stockholders might sue a corporation that had to devalue its assets and stock because of computer fraud-related losses. Another scenario might find stockholders filing suit because loss of highly sensitive trade secrets seriously hurt the corporate balance sheet. Liability of the corporation and its officers to protect its assets and resources, such as imposed by the Foreign Corrupt Practices Act, will similarly be tested.

Drawing Battle Lines

Civil damage suits will also test the concepts of legal responsibility and culpability. It will be interesting to see how the courts attempt to determine responsibility and assign liability for damages. Who will be at fault? The user for not providing better security for a terminal? The corporation for not providing better security for the system? The equipment manufacturer because of alleged flaws in the security design and integrity of the computer system?

To date, little public scrutiny has fallen upon the system development process — its formalism, security design and integrity mechanisms and, in general, the ability of the system to resist or defend against penetration.

Even today the liability battle lines are being drawn. Vendor advertisements in major national magazines are establishing the notions that "privacy begins at home" and "computers don't steal, people do." In its equipment lease agreement, one major vendor very clearly spells out that the lessee bears full responsibility for all aspects of system security — and thus all damages resulting from the system's use or misuse.

Clearly, as liability issues are tested in the courts, all parties — the end users, corporations providing computer-based services and the manufacturers of computers and related systems — will be forced to look more deeply at their own responsibilities and act accordingly.

Economics has always been the key inhibitor to developing more secure computer technology and will continue to be for a number of years. Computer vendors cannot afford to invest in extensive security redesign of their products because of a lack of market demand. Encryption products are a good example. One vendor of an encryption mechanism for protecting resident data bases has reportedly taken an economic bath as a result of its investment in that technology. Another pioneering vendor of communications encryption devices has recently dropped out of the market, citing lack of demand for its product. In both cases, need for the product was not the issue. The economics were such that corporations would not pay the price — or, rather, they were willing to accept the risk.

It has long been recognized that the lower the level of security designed into a system, the greater the

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environmental security required in order to create the necessary "friendly" conditions. Similarly, the more secure the system, the lower the level of environmental security required. The key, then, is to transfer as much security as possible from the external or environmental controls to the internal or system control mechanisms.

Organizations are investing increasingly large sums in both creating and managing the security environment. Eventually, as this investment — sunk costs, really — grows, the efficacy of moving as much control as possible back into the computer will become clear. Right now, few if any meaningful security requirements are being placed upon system vendors.

The recent rash of computer break-ins and abuses has caused experts to estimate that computer security ought to receive as much as 5% and certainly no less than 1% of the annual DP budget. Among the Fortune 500 companies with DP budgets that range up to $300 million and $500 million per year, this recommendation could amount to $15 million to $25 million annually. The price tag for corporate security could approach billions annually.

Eventually, security will become a viable product. Once organizations learn to translate business and consumer security needs into requirements for the vendors, the marketplace will find the stimulus to respond. With "corporate America" energized to the problem, progress in developing more trustworthy systems will be rapid.

Eventually, security will become a viable product. Once organizations learn to translate business and consumer security needs into requirements for the vendors, the marketplace will find the stimulus to respond.

Public Influences

A large, yet unknown factor in this cycle of change is the attitude of the general public. Thus far, the major influences have been institutional — from government and large corporations. However, the real security goals and design objectives must be focused upon the migration of computer technology into the home. It is conceivable that home computers will assume such functionality as to become just as sensitive and critical to the individual as to the large institution.

Therein lies the problem's true urgency. Break-ins involving average citizens' home computers are liable to be reality within the next five years. The spectre of the "wired" society, with individuals or institutions breaking into home computers and invading each other's privacy, is indeed chilling. The average citizen will not be able to afford the extensive physical and environmental controls that are currently required and will be needed for the foreseeable future.

Computer literacy will become a strong motivating influence. As the public becomes more knowledgeable about computing technology, awareness of inherent security problems will increase, and situations that

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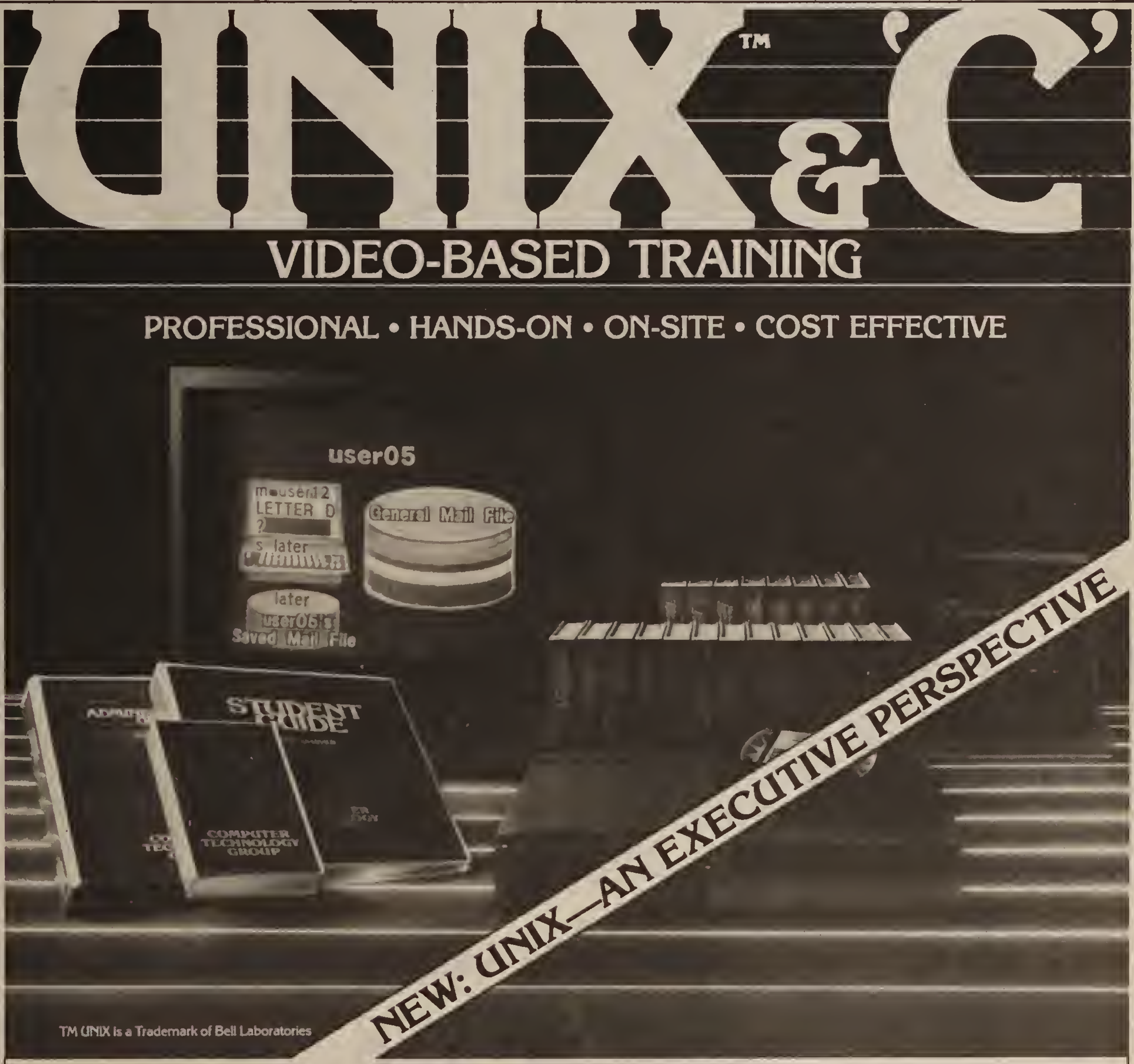
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were acceptable in the large institutional environment will become unacceptable in the home. Thus, migration of computing into the home will similarly accelerate the migration of security into the system architecture. Public demand for more trustworthy architecture could easily become the most effective motivator.

Several conclusions can be drawn regarding the history of security and its apparent future:

1. Our institutional knowledge and awareness of potential computer security problems are incomplete and fragmented. Executive, legislative and judicial bodies are simply not adequately informed.

2. Our national knowledge and awareness of potential computer security problems are similarly incomplete and fragmented. While special-interest groups — data processing, industrial security, privacy, audit, social science, technology, banking, insurance and so forth — have all met to discuss these problems, there has been no common vehicle for pulling their diverse interests and issues together in order to satisfy common needs.

3. As a nation, we are much too irresponsible in handling information. We underestimate its value and misunderstand its sensitivities.

Congress appears to be the only body that can act in the public interest to circumvent the economic barriers that have inhibited development of more secure computer technology.

4. As a nation, we have the most advanced application of the technology but perhaps one of the less-developed perceptions of "informatiques." While we have the most to gain through application of the technology, we may also have the most to lose.

A Charge to Congress

The potential magnitude of computer security problems urges a stronger level of government intervention and regulation. From the struggles of the federal government and DOD over the past decade and a half, it is reasonable to conclude that the problem has been greater than they were able to handle.

Congress appears to be the only body that can act in the public interest to circumvent the economic barriers that have inhibited development of more secure computer technology. Congress should encourage this work in the following ways.

First, it should pass the proposed Federal Computer Systems Protection Act. This legislation will provide not only adequate tools for prosecution but also serve as a major deterrent. The law will focus on the need for improved investigative capability and techniques, one of the major current shortcomings in our ability to prose-

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cute criminal acts.

Second, Congress must address the basic problem that is allowing organizations to provide inadequate protection for sensitive and critical computer systems. Our laws governing information, its ownership, sensitivity and value, as well as custodial responsibilities, are ill-suited for the electronic age and must be updated. The chaotic situation in the areas of copyright, patent and theft of software and data exemplifies this need.

Third, Congress must provide additional incentives for the computer industry to develop new generations of trustworthy technology that apply advanced techniques to security design, verification, validation and product certification. It can encourage more aggressive research and development through incentives such as special tax benefits and revision of antitrust, patent and copyright laws to permit pooling and joint venturing of funds and resources. These incentives will be particularly important to such efforts as supercomputer development.

Fourth, Congress must ensure adequate funding for government computer security programs, including support to research and development. The federal policy (Office of Management and Budget circular A-71, TM 1, published in 1978) has been a paper tiger because too few resources and too little management emphasis have been put into it.

In addition, the government's primary computer security standards body, the Institute for Computer Science and Technology of the National Bureau of Standards, was almost eliminated in the last budget deliberations. Moreover, the government has a limited capability to train, retain and provide career incentives to qualified computer security people.

Fifth, Congress must act to ensure that the public understands the moral and ethical issues surrounding the technology during this period of vulnerability. Public education programs and support to professionalism programs in the form of grants and formal recognition are imperative.

The Institute for Certification of Computer Professionals is the only body in the profession to have policed its membership by withdrawing certification for violation of its code of ethics.

Finally, Congress must make sure that it is fully cognizant of the potential seriousness of these problems. Current congressional hearings on computer and communications security are producing "astounding revelations" that are really neither astounding nor revelations. The course of these hearings indicates that Congress is again in danger of not being adequately informed on security issues.

Three years ago, I called upon Congress to charter 1) a joint industry/government blue-ribbon panel to assess our strategic national vulnerability caused by dependence upon untrustworthy computer systems and 2) a nonprofit computer security foundation to act as a focal point for the creation, integration and validation of a

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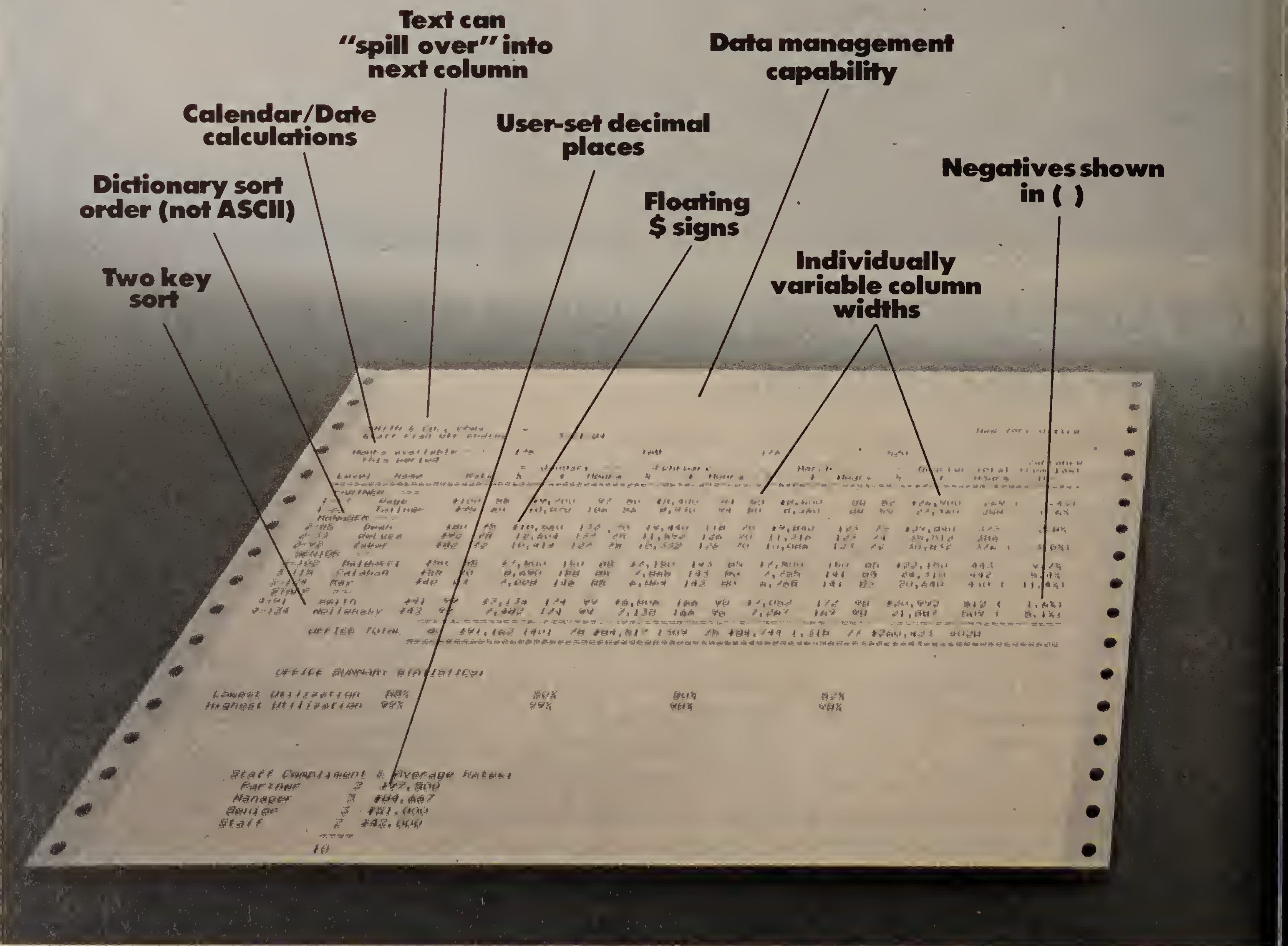
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comprehensive computer security requirements agenda.

Regarding the blue-ribbon panel, most assessments that have been made of the problem have been at too low a level and have grossly underestimated the potential. The problem and its implications may be too serious for anybody other than Congress to assess. Congress should empower a special committee for this purpose.

The computer security foundation, as an independent body without vested interests, would be a valuable instrument to bring about necessary security improvement. Little progress has been made in closing the vulnerability gap since this foundation was proposed three years ago. Rosy predictions that trustworthy systems are just around the corner are unsubstantiated. At the current level of commitment, a decade or more could go by before this trustworthy technology finds its way into the general marketplace.

A Charge to Management

Government and industry must do a better job of identifying security needs so that their data processing staffs and the industry can act to fill them. Unless these security enhancements are demanded and develop economic viability, they will not come about without extraordinary impetus from the federal government.

The computer security problem, while technically based, continues to be a management problem. Senior management is not adequately informed of the deep security implications of the evolving corporate information resource base. As a result, vast investments in computing resources are being made with little if any specified security attributes. Companies are applying after-the-fact or retrofitted security, using the "add-ons" currently available from the marketplace. Business is operating in a highly reactive mode.

Companies must look beyond these short-term reactionary needs and deal with the long-term causes. Management must question the status quo and, where appropriate, refuse to tolerate the risk. Senior management should require that all new systems and acquisitions be accompanied by an assessment of system sensitivity and criticality and an appropriately detailed statement of security requirements.

About the Author

Robert Campbell is president of Advanced Information Management, Inc., a Woodbridge, Va., consulting firm specializing in computer and telecommunications security, privacy, audit and contingency planning. The company's services are oriented to banking, financial services and other major Fortune 500 industries.

Campbell has more than 20 years' experience in data processing, security and audit in both government and industry.

He is currently president of the Institute for Certification of Computer Professionals and serves on the editorial advisory boards of the Computer Security Journal *(U.S.),* Computer Fraud and Security Bulletin *(UK) and* Corporate Fraud Bulletin *(UK).*

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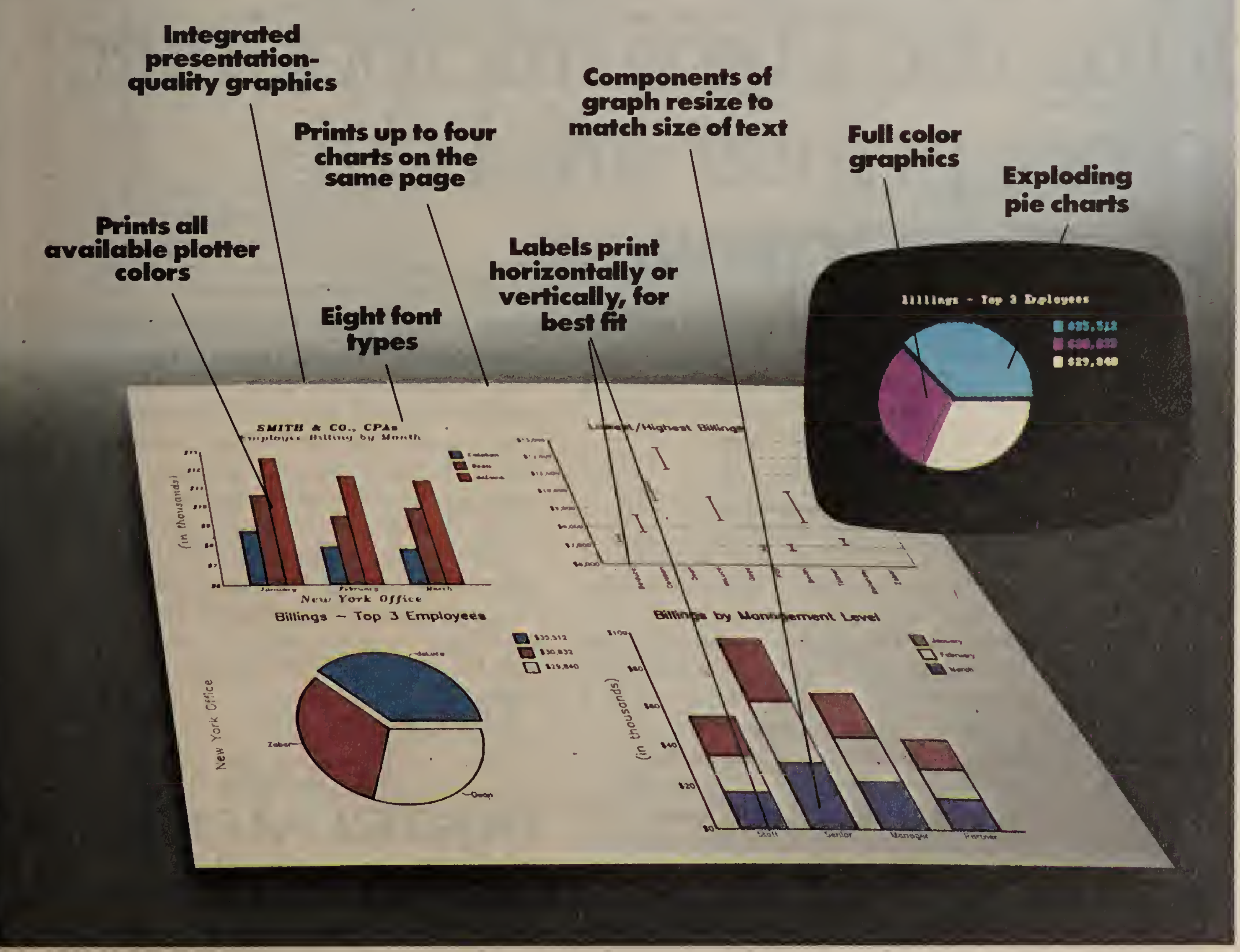
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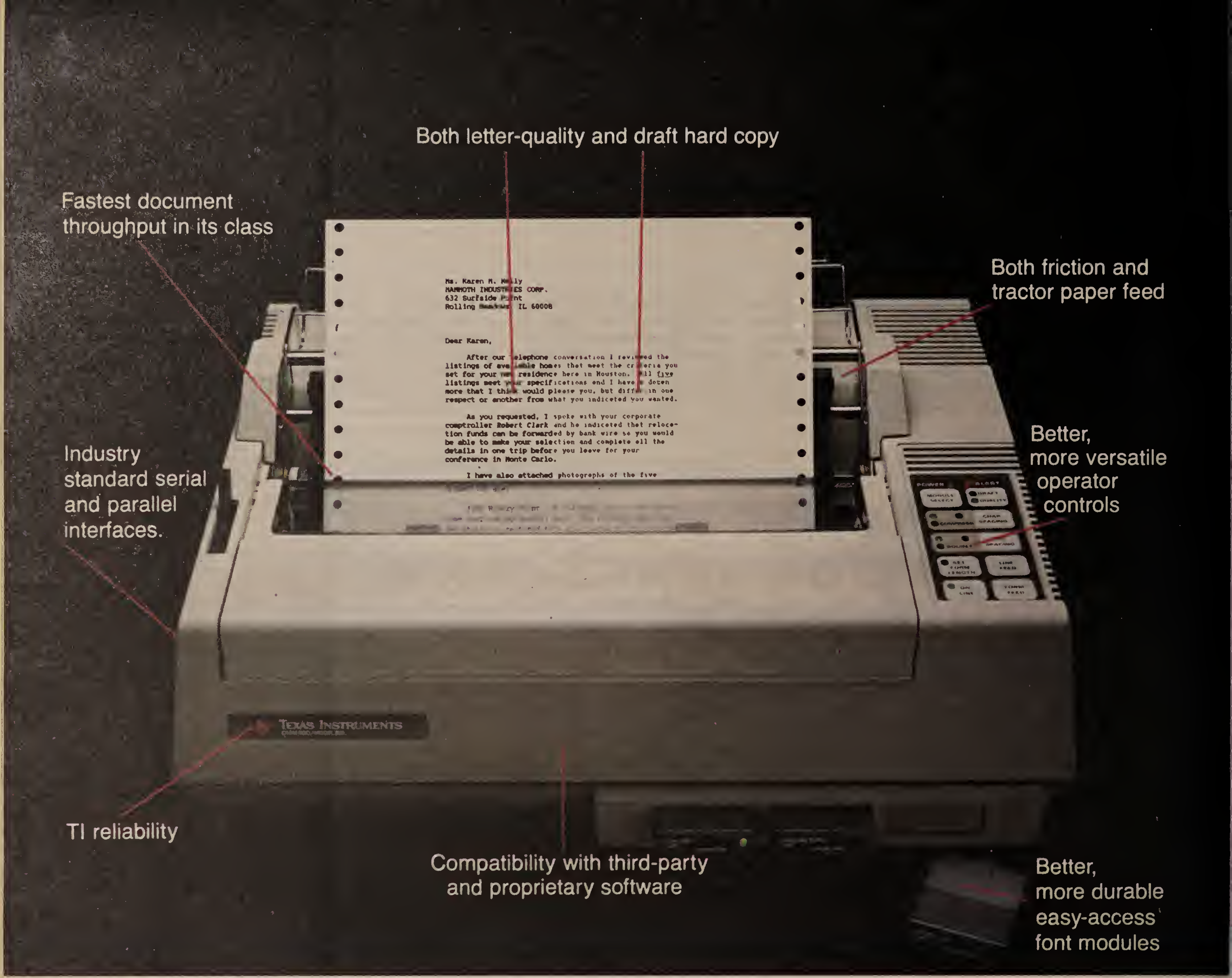
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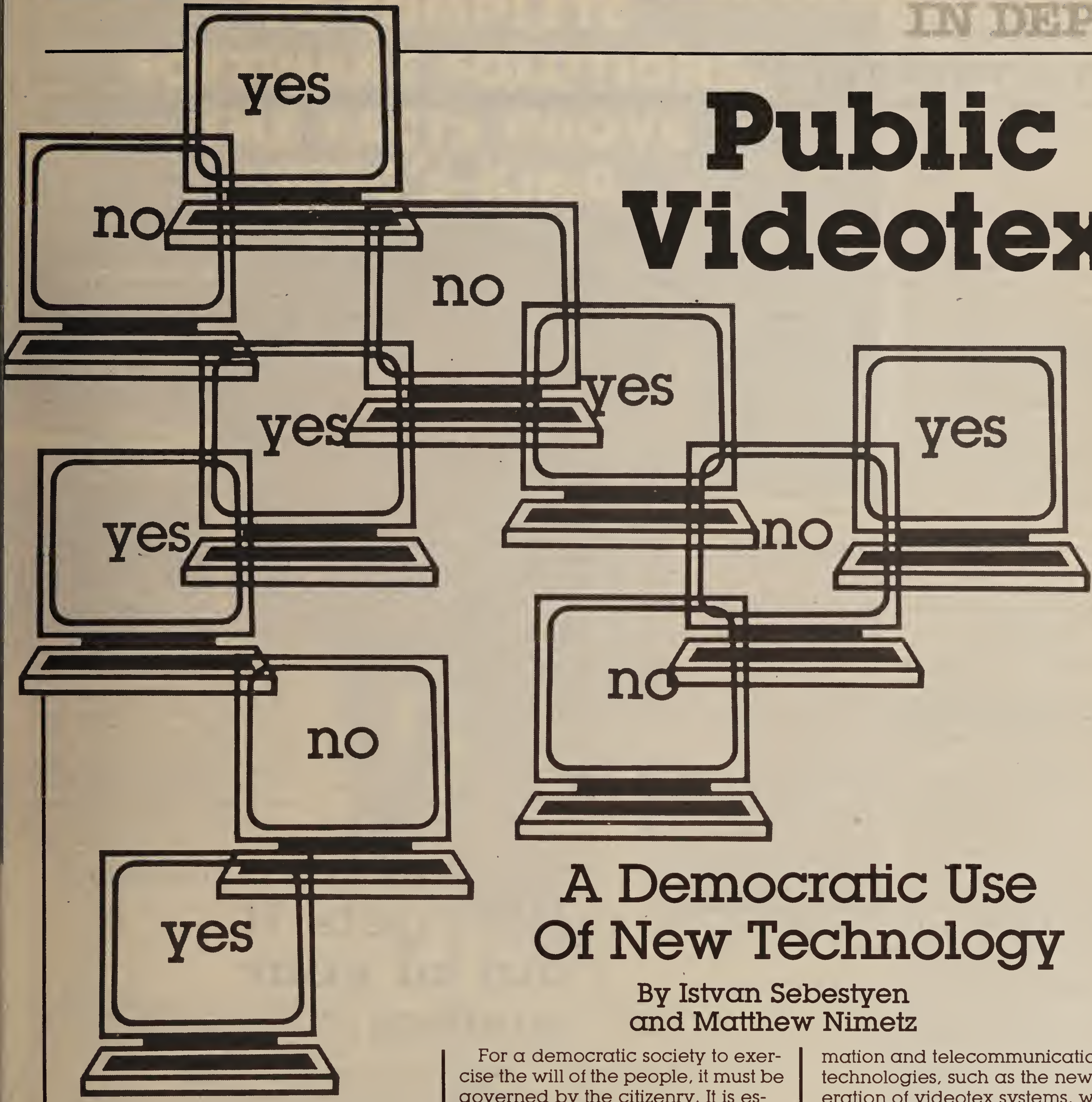

A Democratic Use Of New Technology

By Istvan Sebestyen
and Matthew Nimetz

For a democratic society to exercise the will of the people, it must be governed by the citizenry. It is essential that the flow of information between those who govern and those who are governed is secured. While it is assured that certain groups with a common interest (political bodies, churches, associations and so on) can make their voice heard through the mass media, it is still relatively difficult for the individual citizen to contribute on a regular basis to the flow of information between rulers and ruled, except for a "yes" or "no" every two, four or five years at election time.

Consideration should be given to introducing a system that gives due weight to the voice of the individual in a constant manner as policy is formulated and implemented by government. We believe that information and telecommunications technologies, such as the new generation of videotex systems, will soon provide valuable tools for expressing public opinion. At present, systems with such applications do not exist on any national level, except experimentally. But not much imagination is needed to foresee that within the next few years, such systems could be built and introduced on a wide basis.

It is because of this potential that engineers, media experts, industry representatives and other groups should join with politicians and legal experts to discuss and predict what this type of system could mean for society. With this article, we try to take the first step in that direction.

In order that we keep in touch with reality, the focus of our investigation will be special applications of the new-generation videotex systems that support public opinion expression, such as an electronic "speakers corner," "notary public," "ombudsman" and electronic polling and voting. By "new-generation videotex systems," we mean a nationwide public system, such as will be introduced in the Federal Republic of Germany and Austria in 1984. These systems will be equipped with intelligent videotex decoders, such as the Austrian Mupid, which is already on trial in Austria, the Federal Republic of Germany, the UK and elsewhere. Mupid is rented from the Austrian postal, telephone and telegraph authority (PTT) for about $5 per month.

In our context, public videotex systems are really nothing more than an inexpensive — preferably packet-switched — computer network allowing mass computer networking applications for daily life. Uses include various information retrieval and transaction functions: flight schedules and reservations and, perhaps, payment, through a cheap home terminal. Such terminals may use the home TV set as an output device, combined with a cheap dedicated intelligent videotex decoder (basically a dedicated personal computer) and linked to suitable telecommunications channels — a telephone in most cases.

The intelligent videotex decoder allows for all the above components to be combined into an intelligent home terminal of a sophisticated but inexpensive computer network and, in addition, functions as a stand-alone personal computer.

Public-key cryptosystems and videotex. Videotex and public-key cryptosystems are relatively new concepts that emerged during the late 1970s (for a basic explanation, see In Depth/23).

New-generation videotex systems use alphanumeric keyboards and intelligent videotex decoders (basically dedicated personal computers, such as Mupid), which extend the original functions of videotex user terminals tremendously. Not only can information frames be retrieved and simple transactions (such as booking) be performed, but telesoftware frames (special information frames) can also be downloaded into the local processor of the intelligent decoder and executed. Through this philosophical change in the use of videotex, a whole new range of applications has been created.

One example of such a new application is the public-key cryptosystems, to be implemented on videotex by means of intelligent videotex decoders. Thus, from the technical point of view, videotex applications using public-key cryptosystems are made possible by the introduction of intelligent videotex terminals, the use of telesoftware, the standard videotex message-sending service and, in some applications, the use of a videotex gateway, which is really nothing more than a link between a specially programmed third-party computer, such as a bank computer, and the basic videotex computer network. Through this gateway, videotex users can access these third-party computers for special videotex applications, such as home banking.

Public-key cryptography is based on the suggestion of Whifield Deffie and Martin Hellmann (both from Stanford University) to break with traditional schemes of using the same encryption/decryption key for coding and decoding secret messages. They suggested using different keys for the encoding and decoding processes so that it would be possible to reveal the encryption key publicly, while still keeping the appropriate decryption key secret (Figure 1).

In this way, secure one-way communications could be established. Anyone could create and send a secret message to the owner of the decryption key (secret key) without having to fear that his message could be decrypted by anyone else but the

(Continued on In Depth/21)

Corresponding encryption/decryption key pairs should have the following properties:

1. Ds(Ep(M))=M Encrypting (E) of message 'M' with public key 'p,' then transmitting and decrypting (D) with secret key 's' should result in the original message. This is essential for secure messaging.
2. Dp(Es(M))=M Encrypting the message with secret key 's,' then transmitting and decrypting with the public key 'p' should result also in the original message. This is essential for authentication.
3. Publicly revealing encryption and decryption procedures and the so-called public keys does not allow individuals to find out easily the secret key of a particular user of the system. This is needed for secure messaging and authentication.
4. Public and secret key pairs should be easy to generate.

Figure 1

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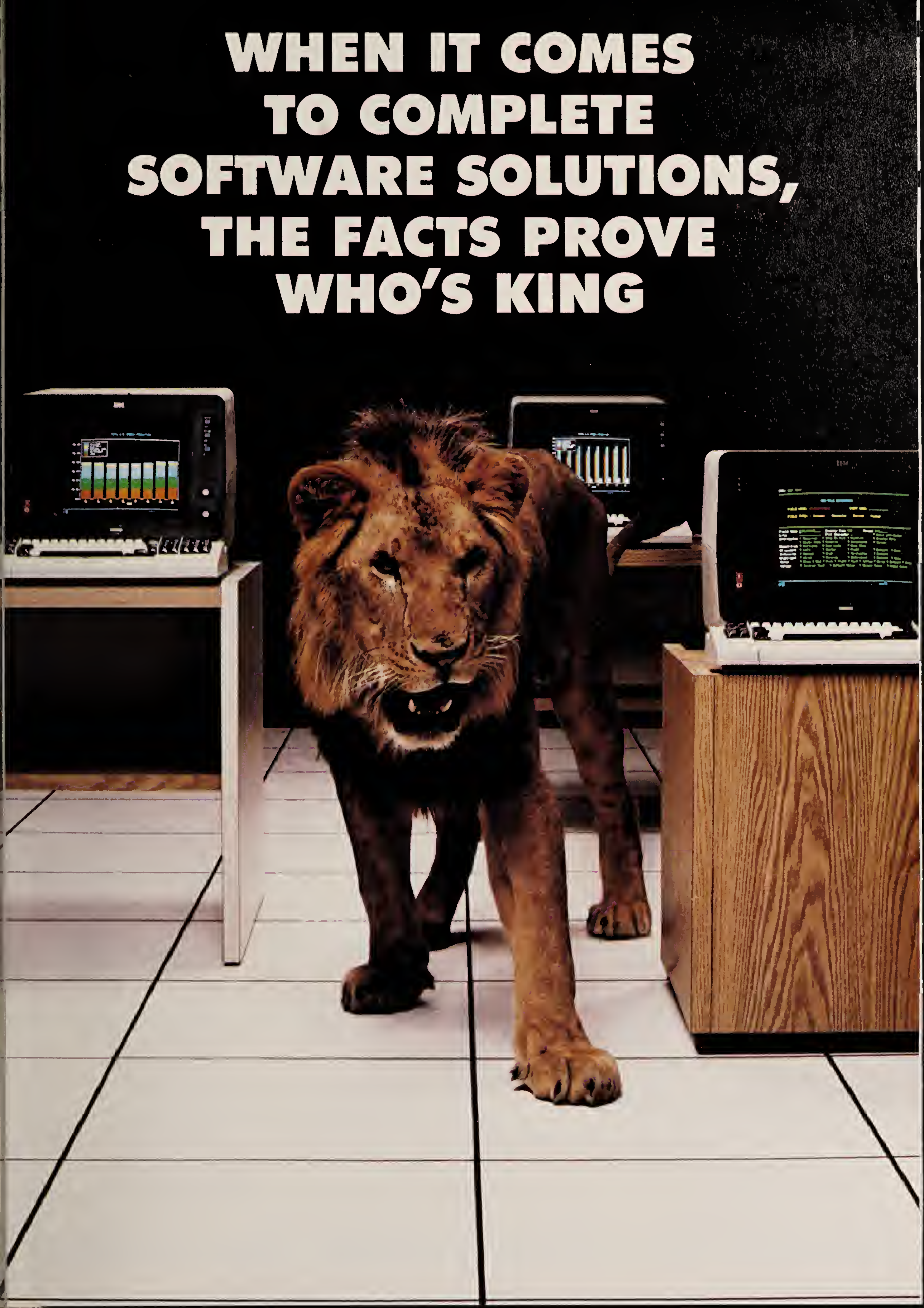
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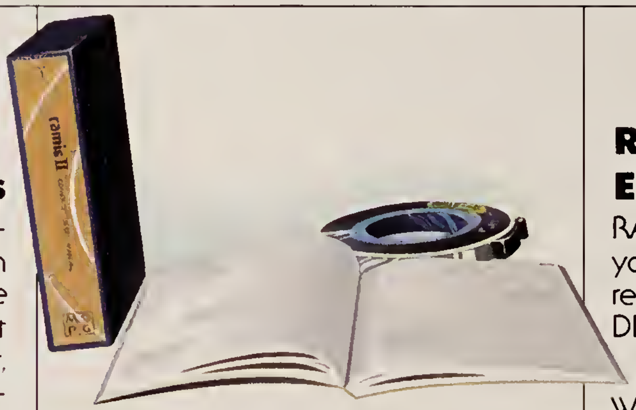

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Continued from In Depth/16)

ner of the secret key. In ler to have two-way (per- n-to-person) communica- ns, everyone participating the public-key system ist possess and keep his in- idual, secret decryption y while announcing pub- ly his encryption key. That cryption key is used by the it of the community when ret messages are to be ad- essed and sent to him.

The usefulness of linking blic-key cryptography to deotex, from the technical ints of view, should al- ady be obvious:

1.. The encryption keys ublic keys) of users for blic access can ideally be it on public videotex infor- ation frames as a "public- y directory," whereas de- yption keys have to be kept cretly at the videotex user's cation.

2. The message-sending pability of videotex can be eally used for sending the ded messages.

3. The telecommunica- ons software programs eeded for encryption and ecryption of messages are to e stored as information ames on the videotex sys- m as well and are to be ownloaded into the intelli- ent videotex terminal for ecution when messages are be encoded or decoded.

4. Certain administrative ypes of functions, such as dministration of keys and eeping track of transac- ions, can also be solved with elative ease by videotex net- vorks.

The reason we are inter- sted in cryptography, and specially public-key crypto- ystems, is that this tech- ique — if linked to a public videotex system equipped with gateway and intelligent videotex decoders — could provide many basic services that will be needed in a future information society.

The fact that public-key cryptosystems with the novel property of publicly revealing an encryption key (in our case, on videotex) do not thereby reveal the corresponding decryption key has some important consequences, which should be spelled out separately:

1. Couriers or other secure means are not needed to transmit keys, since a message can be encrypted using an encryption key that was publicly revealed earlier by the intended recipient. Only he can decipher the message, since only he knows the corresponding decryption key (see Figure 2a on In Depth/24).

Thus, for the distribution of encryption keys, an "insecure" channel, such as a

(Continued on In Depth/24)

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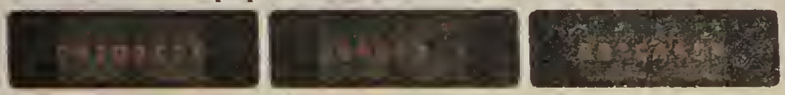

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The Basic Forms of Videotex Systems

One-way videotex broadcasts in a cyclical manner the data frames stored on a central computer. In the medium called teletext, either the vertical blanking intervals of traditional TV programs are used or dedicated separate channels, such as TV cable channels.

Different types of videotex decoders are used as teletext terminals. The decoder is usually built into the TV set, and a person uses a numerical key pad to select information frames (maximum 1,000 characters per frame) to be picked out from the information cycle by the decoder and displayed on an ordinary TV. Since the amount of information on teletext is limited to only a few hundred frames, not much local intelligence is built into the standard teletext decoders.

> ***Teletext systems are widely used. Users in Austria already number approximately 130,000. In our view, the medium's strongest application is linked to normal TV programs, such as subtitling or information for the hearing impaired.***

Such systems are already widely used. Teletext users in Austria already number approximately 130,000. In our view, the medium's strongest application is linked to normal TV programs, such as subtitling or information for the hearing impaired.

The amount of information cycled on full-channel teletext systems is considerably larger, up to about 50,000 frames, a considerable amount of data. Thus, in such cases, intelligent videotex decoders (basically dedicated personal computers) have to be used to utilize the data presented in the most appropriate way.

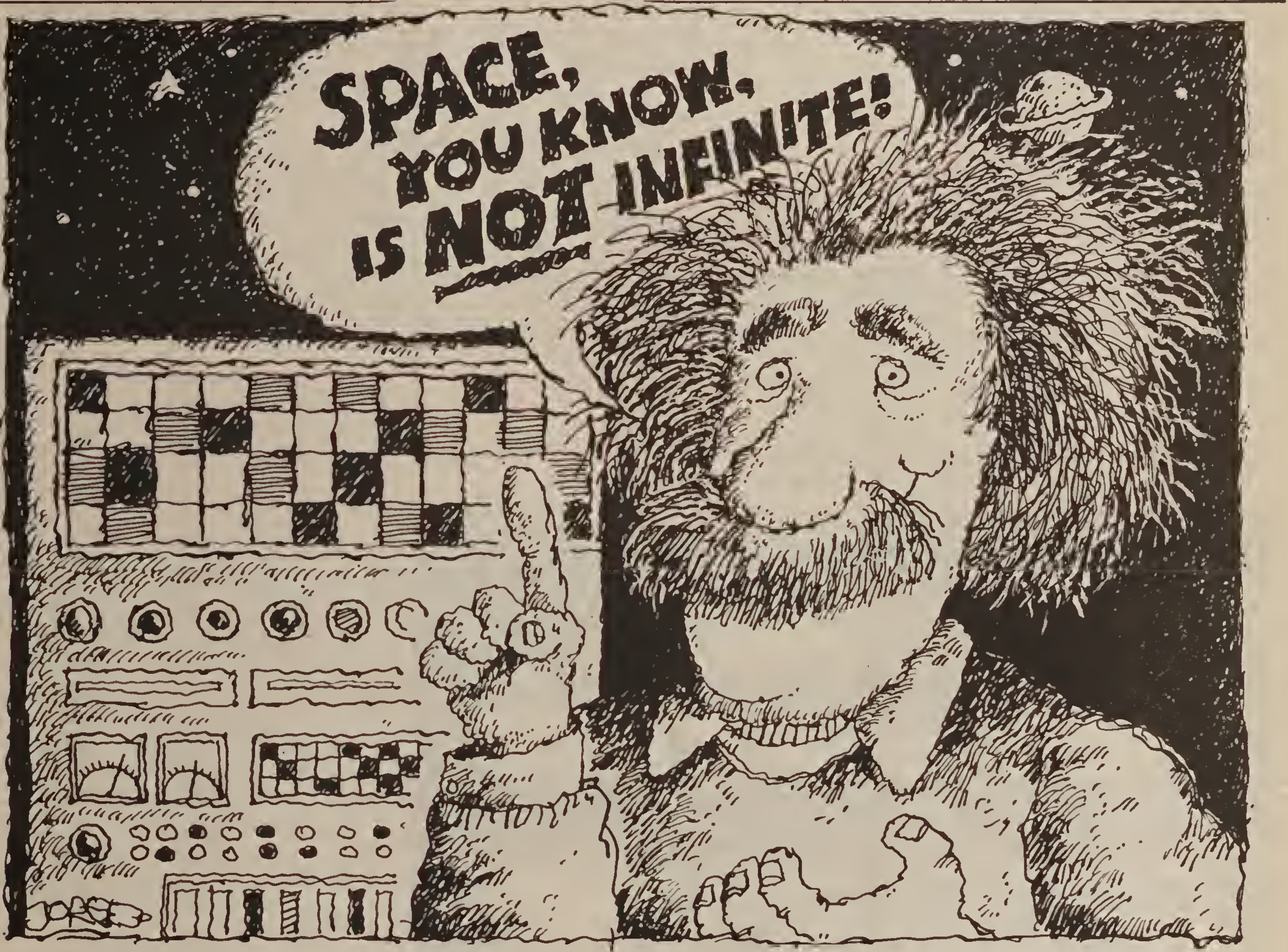
Interactive Versions

Two-way videotex systems — often called viewdata in Europe — are also built on computers storing data frames, similar to the one-way videotex systems, except that communication between the system and the user is based on interactive (individual) communication as opposed to teletext's broadcast communication.

The telecommunications medium used for interactive communications is the traditional telephone network, the emerging data networks and the upcoming two-way cable networks. Two-way videotex systems have advantages over one-way systems for certain applications, such as individual message sending, booking and transactions. In the future, one-way and two-way systems are likely to converge so that they supplement each other rather than compete.

At present, different types of two-way videotex systems are in use. The earliest type of videotex systems, such as the British Prestel, use modified TV sets with built-in videotex decoders as user terminals. They are equipped with numerical key pads allowing the user to search for any frame in the Prestel "information tree" by numbers.

The standard public-switched telephone network is used as the telecommunications medium between the videotex information center and the user through a serial interface in the TV set and a low-speed asynchronous modem.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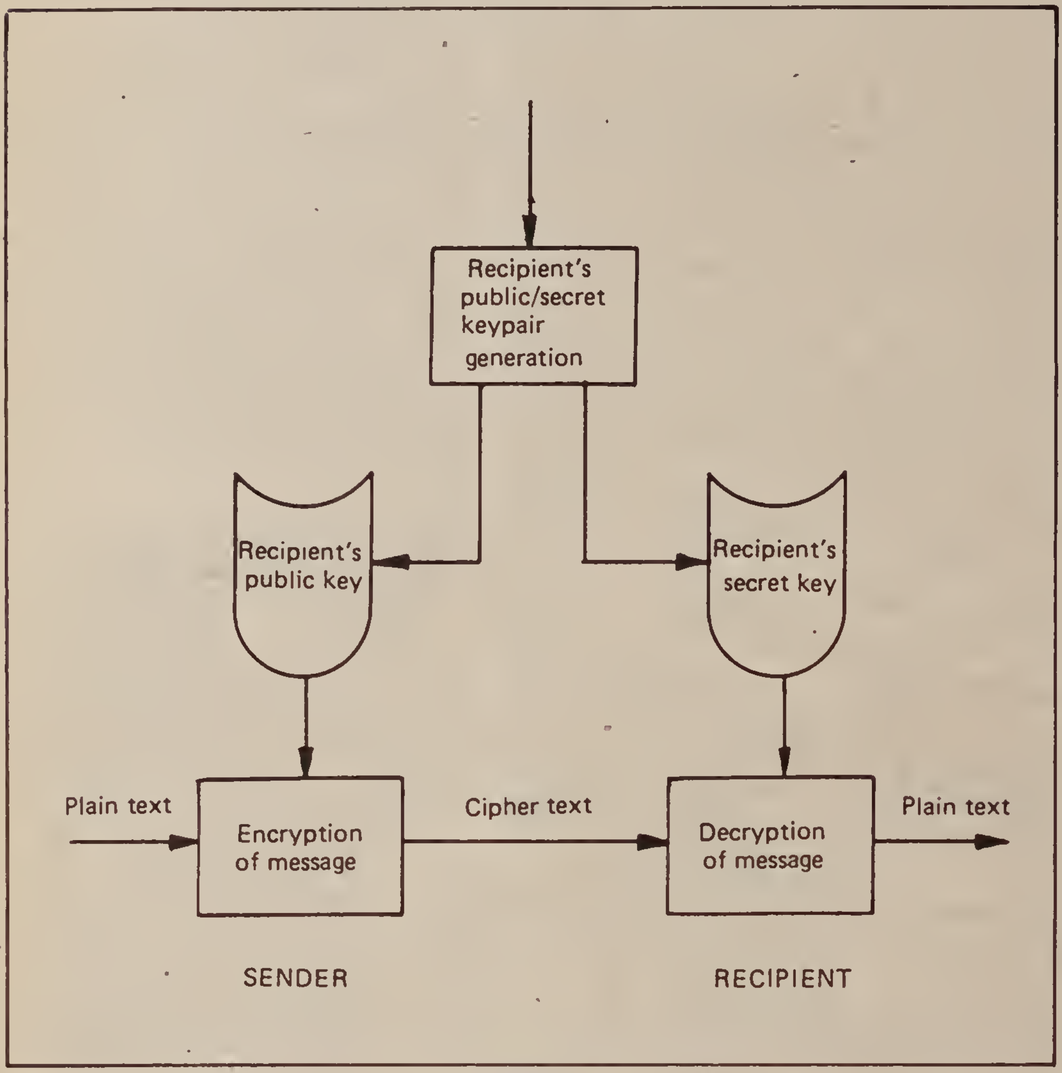

Figure 2a

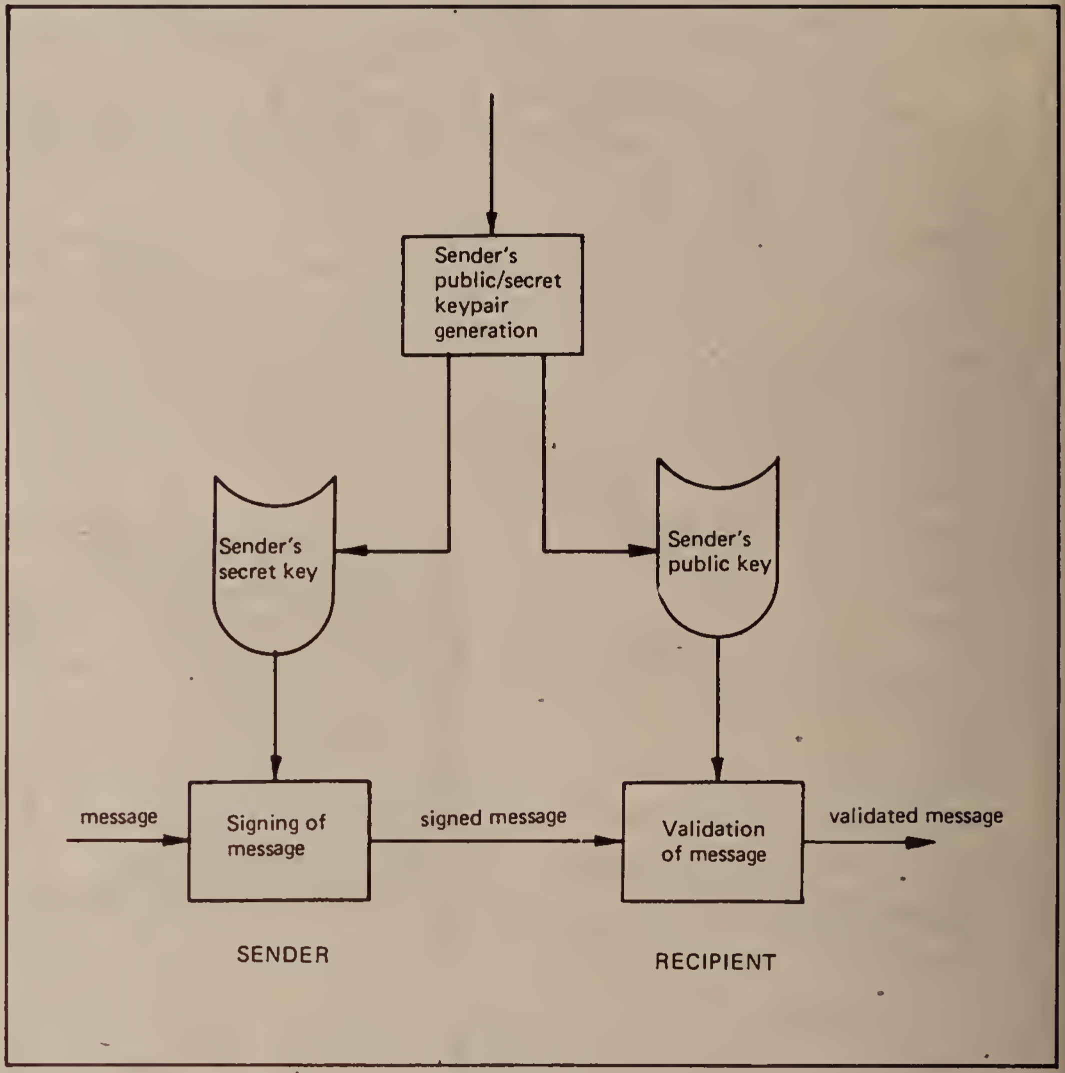

Figure 2b

(Continued from In Depth/21)

videotex data base (the public-key directory), is ideal.

Nonetheless, privacy of messages can still be guaranteed since a potential "wiretapper" who gets hold of the transmitted encrypted message only sees "garbage" (the ciphertext), which makes no sense to him since he does not know how to decrypt it.

2. As a special use of public-key systems, a message can be "signed" using the privately held secret key. Anyone can verify this signature using the corresponding publicly revealed key in the "public-key directory" of videotex. Signatures cannot be forged, and a signer cannot later deny the validity of his signature. This feature has obvious applications in electronic mail, electronic funds transfer, electronic voting or "electronic contracts" (Figure 2b). If electronic message sending and transaction systems based on videotex are partly to replace the existing paper mail and other transaction systems, "signing" an electronic message is fundamental and must be possible.

An electronic signature must be message-dependent as well as signer-dependent. Otherwise, the recipient could modify the message before showing the message-signature pair to a judge. Or he could attach the signature to any message whatsoever, since it is impossible to detect electronic "cutting and pasting."

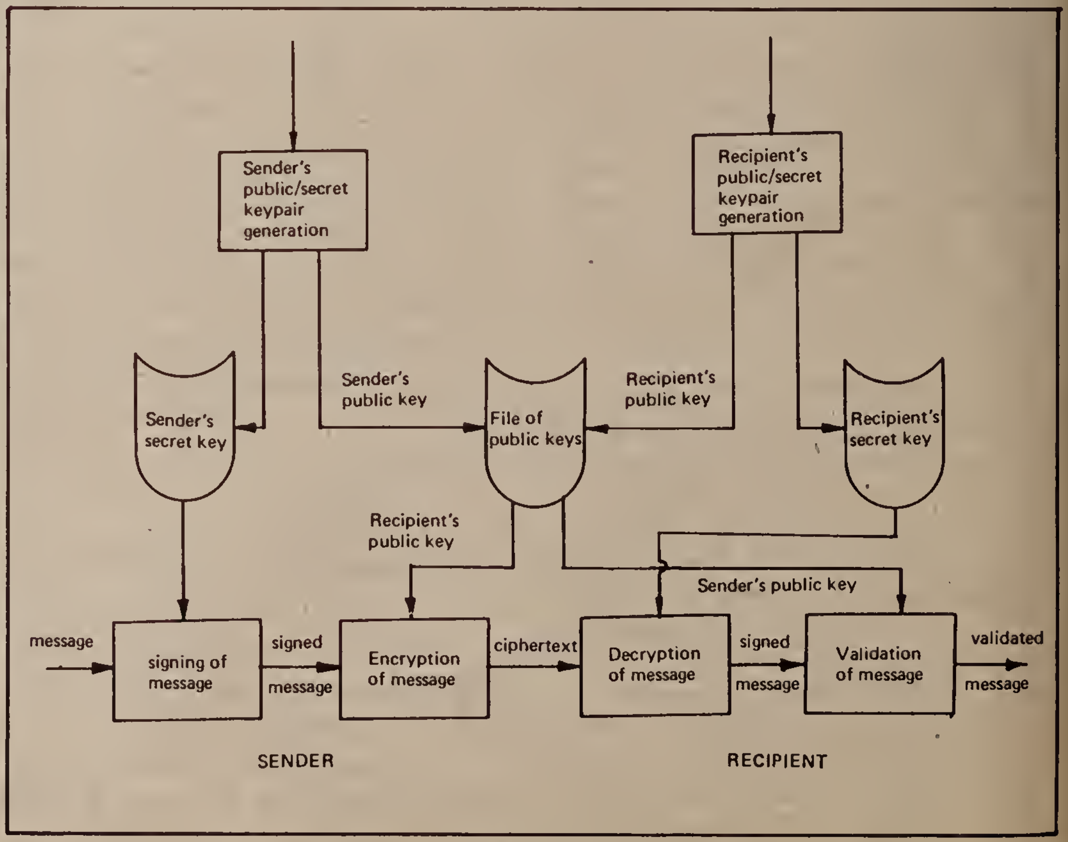

Figure 2c

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These conditions can be fulfilled by a public-key cryptosystem. When sending a signed message, the sender uses his own secret key (known only to him) to "compute" his "signature." This coded message can be decrypted by the recipient by using as a decryption key the public key of the sender found in the "public-key directory," which is, as we have seen above, also used when encoded messages are sent to him. If the decoded message is meaningful, then the recipient of the message has the proof that it originated from the sender.

3. "Signed" messages can obviously also be sent "secretly" from sender to recipient, if the sender encodes his "signed" message (through his own secret key) according to the public key of the recipient looked up in the videotex public-key directory (Figure 2c). Such a message transmitted by the message-sending service of videotex can, as we have seen above, only be decoded by the addressee.

To enable public-key systems to be used for signature, it has to be ensured that the encryption/decryption key pairs used allow subsequent coding and encoding (or vice versa) of each message without changing the original context of the message.

We believe that public-key cryptosystems can be widely used in videotex networks for a number of novel applications. In what follows, we only mention a few possibilities, some of which are linked with the expression of individuals in public opinion.

Public opinion expression. An "electronic speakers corner" can easily be implemented, even on most of the present, first-generation videotex systems. A prerequisite is to appoint or accept a special information provider who is willing to function as an electronic speakers corner. Anyone who then wants his voice to be heard can send his message to the information provider through the message-sending (note: only with full alphabetical keyboard) service of videotex or through the response frame capability of the videotex textframes.

It is then the function of the speakers corner to put the received message on his information frames. The question of what or what not to put up — thus to exercise a kind of censorship function — is a key issue on how the electronic speakers corner would function. (At this point, it should be mentioned that by accepted convention at Speakers Corner in Hyde Park in London, the Queen and the Royal family, for example, may not be abused.)

Information frames on public opinion could be kept on the system for a designated time period. Some information frames could also be supplemented by response frames to ask for public reaction to a specific issue. For example, a citizen claiming there is a need to build a road that bypasses his village could seek support for his appeal from fellow villagers through the response frames.

The speakers corner would, of course, cost money to operate. To cover expenses, the operator of the videotex services — for example, the PTT — might be required by law to provide the electronic speakers corner service. In a similar situation, cable TV operators in the U.S. are often required as a condition of their franchise to offer the public citizen channel free of charge. The amount, frequency and type of information for which citizens might use this free videotex information channel would need to be clearly established by law or regulation.

Electronic voting. A simple type of electronic voting and public opinion polling is also possible on existing first-generation videotex systems with or without a full alphabetic keyboard. The information provider performing the public opinion polling or voting could put up questionnaire-type response frames on the system. Subscribers looking up the frames of this special information provider could then fill in and send back the appropriate response frames.

If the information provider had an intelligent videotex terminal, such as Mupid, he could then process the collected response frames, for example, to produce integrated final statistics to show polling and voting results. This technique may not, however, be sufficient under all

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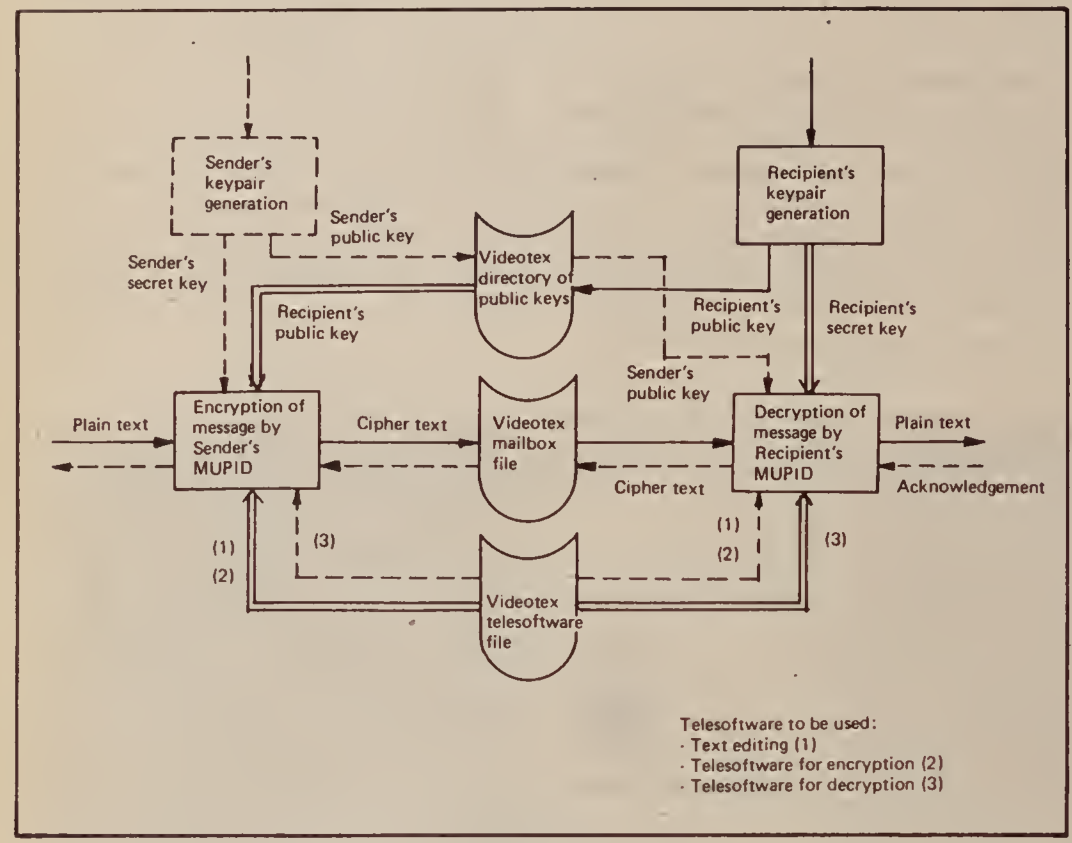
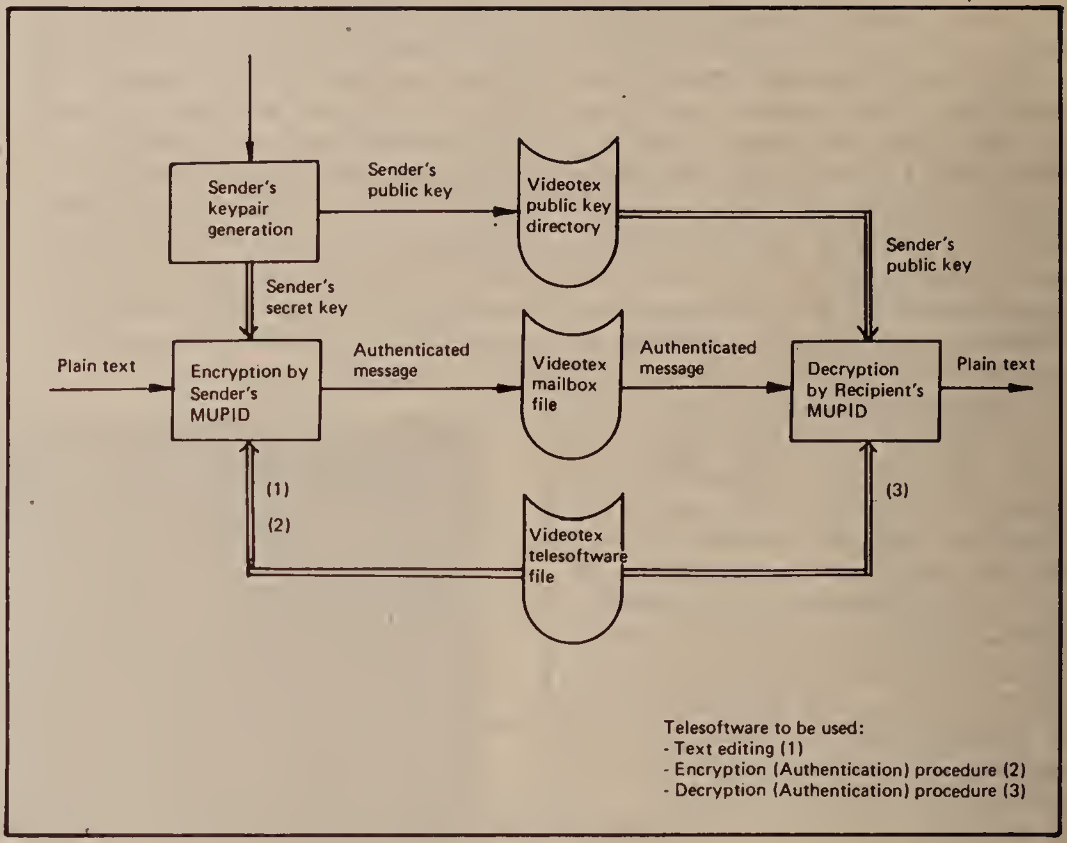


Telesoftware to be used:
- Text editing (1)
- Telesoftware for encryption (2)
- Telesoftware for decryption (3)

Figure 3



Telesoftware to be used:
- Text editing (1)
- Encryption (Authentication) procedure (2)
- Decryption (Authentication) procedure (3)

Figure 4

conditions. Polling and voting through response frames is linked to a specific user identification and password, but not to individual people. For example, the International Institute for Applied Systems Analysis is listed as one subscriber on the Austrian videotex system. It would be a similar case with a family, where in Europe the head of the family is usually by law the subscriber.

The videotex system therefore can only distinguish a particular subscriber and not the individual users working under that subscriber identification. For this reason, no guarantee is provided by the system, for example, to identify whether a new car that was ordered through videotex was ordered by the father who really wants a new car or by his children who just thought it would be nice to own.

The same is true, of course, for public polling or voting, when individual family members may have different opinions and certainly have separate votes. In order to gain further identification, then, usually one of the questions asked on a response frame is the name of the person filling it in. There is, however, no way for the system to check whether this type of identification is authentic, and in many applications, especially voting, authentication is essential. As already mentioned, one way to solve the authentication problem is by public-key cryptosystems.

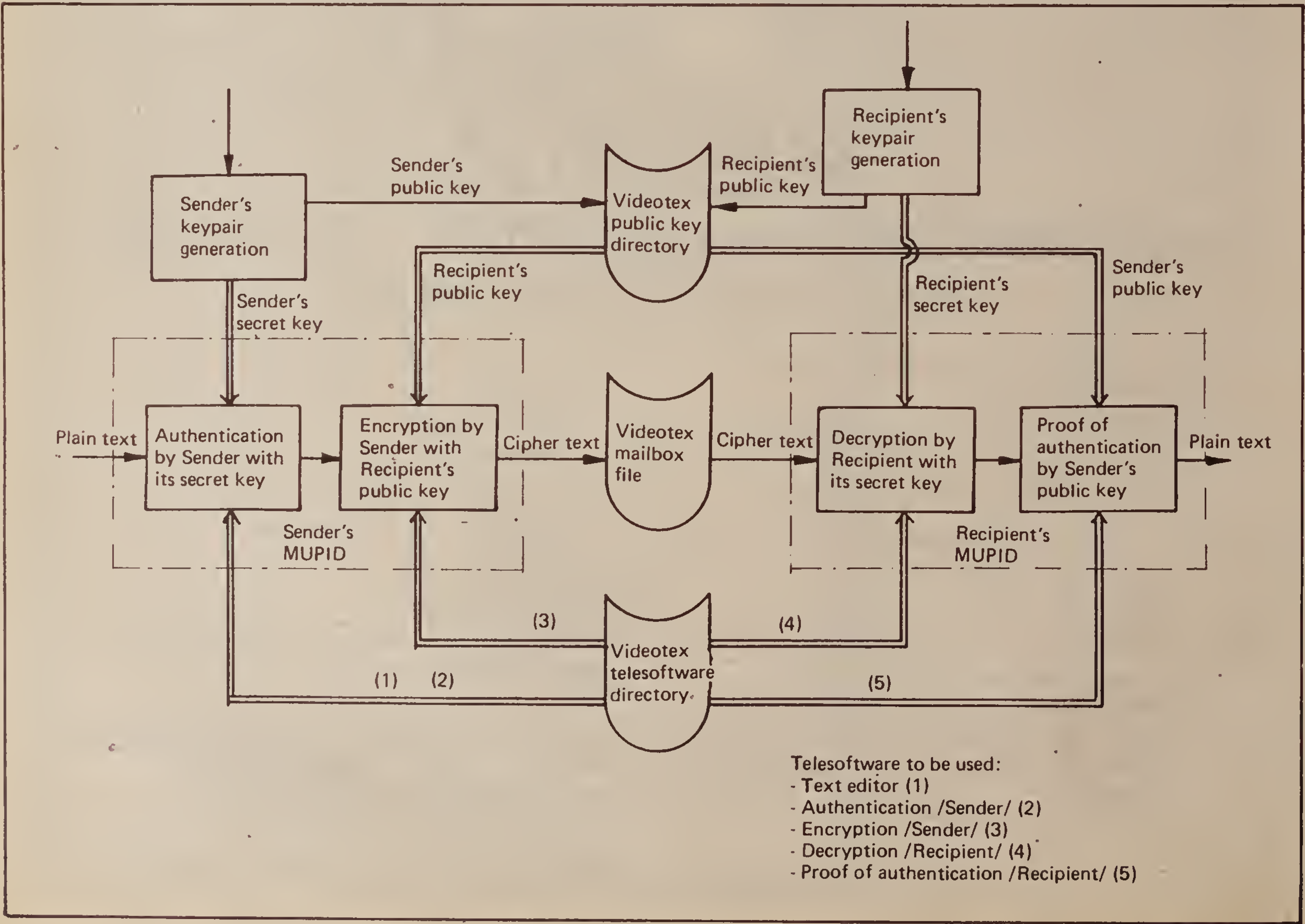
Secret message sending is also often a required need for certain transactions — for example, the message between a customer and his bank. For this reason, even though any traditional computer transaction system or videotex provides a certain degree of data security, additional measures to increase the level of security — for example, through cryptography — are always welcome. To introduce cryptography on videotex systems through public-key cryptosystems is one potential way, especially if intelligent videotex decoders, such as Mupid, are used.

In many cases, both authentication and secrecy are required. In the case of voting, the vote has to be authentic. There must be assurance that the vote has come from the person to whom it was ascribed and that it is a valid vote (that is, that the vote has been placed only once and not later or earlier than it should have been).

The content of the vote, however, should remain hidden from the authentication-checking process. Nobody else should know or be able to find out, for example, whether Franz Joseph Strauss voted for the SPD (it is purely his private affair). Also, at the second stage, when the content of all votes are revealed and the valid votes are added up, again no one should be able to recognize that a given "yes" for the SPD actually came from Franz Joseph Strauss.

In principle, all these requirements can be implemented using public-key cryptosystems. How these basic functions can be implemented on videotex is shown in Figures 3, 4 and 5. Text editing, encryption and description of messages are performed locally by intelligent videotex decoders. The programs and encryption keys needed are downloaded from the videotex system.

In the figures, we show the videotex public-key directory and the videotex telesoftware file separately for better understanding, but these are stored on standard information frames. Messages are sent to the receivers' mailboxes in a store-and-forward manner through the standard message-sending function of videotex. Actually, the following applications are built on the basic functions shown in Figures 3 through 5.


Sender's keypair generation
Sender's public key
Videotex public key directory
Recipient's public key
Recipient's keypair generation
Recipient's public key
Recipient's secret key
Sender's public key
Sender's secret key
Plain text
Authentication by Sender with its secret key
Encryption by Sender with Recipient's public key
Cipher text
Videotex mailbox file
Cipher text
Decryption by Recipient with its secret key
Proof of authentication by Sender's public key
Plain text
Sender's MUPID
Recipient's MUPID
(3)
(4)
(1)
(2)
(5)
Videotex telesoftware directory

Telesoftware to be used:
- Text editor (1)
- Authentication /Sender/ (2)
- Encryption /Sender/ (3)
- Decryption /Recipient/ (4)
- Proof of authentication /Recipient/ (5)

Figure 5

In this whole process, there are a few critical technical points that have yet to be solved properly. One problem is the distribution of the secret private keys. First, appropriate key pairs have to be generated, preferably by the key administrator. This function could best be accomplished on a dedicated third-party computer linked to the videotex network. The public keys can be put on the videotex system in a public file by the key administrator. The secret key then has to be forwarded to the subscriber who wants to receive crypted messages or send authenticated messages.

The problem here is that if sent through the "insecure" videotex message channels, this information, in principle, could be wiretapped by a third party. One possibility would be to pick up the private key in person from the key administrator. This option is certainly secure, but then one particular beauty of the public-key system, the flexible change of crypto-keys, is lost. Another possibility would be to pick up in person a crypto-key that is only used for the distribution of keys between administrator and user. In this way, the request for new keys would have been authorized both by this special key and the old private key — the new key would be sent through the special key. The likelihood of both keys being stolen is far less than for just tapping the private key.

A third possibility might be for the key administrator to send out in a random way special pages containing various unused private-key options; each key would get an identification number. If a user wants to change his private key, he simply selects one of the upcoming private keys, which he stores locally, and informs the key administrator through the public key which key he has selected as the private key.

A fourth possibility could be that this selected key is used only temporarily between user and key administrator to establish a secure temporary channel through which the user would finally receive his private key.

A completely different method of key distribution would result if the generation of public-key pairs could be performed locally by every user. In this case, the user would simply retain his secret private key and only submit his newly generated public key to the key administrator. In this fashion, the "dangerous" distribution of private keys from the key administrator could be avoided. The key administrator would first check that the submitted public key does not already belong to another subscriber, in which case it would be necessary for an alternative key pair to be generated and submitted.

This checking procedure could be done by a third-party computer. Even if the list of subscribers stored in the system is large (say, millions of subscribers), special programming techniques can easily be arranged so that the checking procedure is fast. One known technique, for instance, could be to list the public keys in increasing order; then, by using a binary searching technique, it would be simple to find out quickly if the same key already exists or not.

Estimates have shown that a 50-digit key could be broken by the fastest algorithms and machines of today in approximately 3.9 hours; 75-digit keys would take 104 days; 100 digits, 74 years; and 200-digit keys, 3.8 times 10^9 years (3.8 billion years).

There are certainly many technical problems associated with this technique; for example, the key length would need to be as long as possible, not only to provide increased security but also to make the creation of new, unoccupied key pairs by the subscriber easier. Another problem to solve is key generation itself, which is a rather long, complicated, number-crunching process.

The number of key distribution

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74-08660-00	BLOCK, SWITCH	5	50%	2
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74-11120-00	DOOR CAB (700-9648)	60	50%	30
~~[illegible]~~	~~INSTALLATION KIT 70-9488 LA30~~	~~20~~	~~50%~~	~~10~~
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MEMORY				
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H212 -00	8K 12 BIT H211,MM8-EJ	1,662	50%	831
K202 -00	TWO GENERAL PURPOSE GATED F-F	51	35%	33
K210 -00	4 BIT BCD OR CINARY COUNTER	46	50%	23
M237 -00	12 BIT BCD U/D COUNTER	77	50%	39
M6850-00	16 BIT FLIP-FLOP DC OUTPUT	226	35%	147
M781 -00	PC11 CONTROL	528	50%	264
~~M781 -00~~	~~PC11 CONTROL~~	~~528~~	~~50%~~	~~264~~
M7880-00	FP11E FNUA(FLOATING POINT)	2,484	50%	1,242
M7983-00	32KX18 CONTROLLER	1,210	50%	605
M8098-00	ICR11 REMOTE MODEM CONTROL	1,051	50%	525
M8265-00	DATA PATH,HEX(KD11EA)	2,717	50%	1,359
M8266-00	CONTROL,HEX(KD11EA)	2,459	50%	1,230
M8294-00	32K TIMING UNIBUS INTFACE	506	50%	253
M847 -00	MI8E BOOTSTRAP LEADER	809	50%	404
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M8557-00	MASS BUS CONTROL 4	3,883	50%	1,941
M866 -00	SYNCH MODEM INTERFACE	575	50%	288
M906 -00	CABLE TERMINATOR	257	50%	129
SPRL8-A	RL8-A SPARE MODULE (M8433)	1,720	50%	860
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29-22172-00	CABLE ASSY, SERVO CONTROLLER	214	50%	107
29-22234-00	PCBA POSITION SERVO	1,193	35%	776
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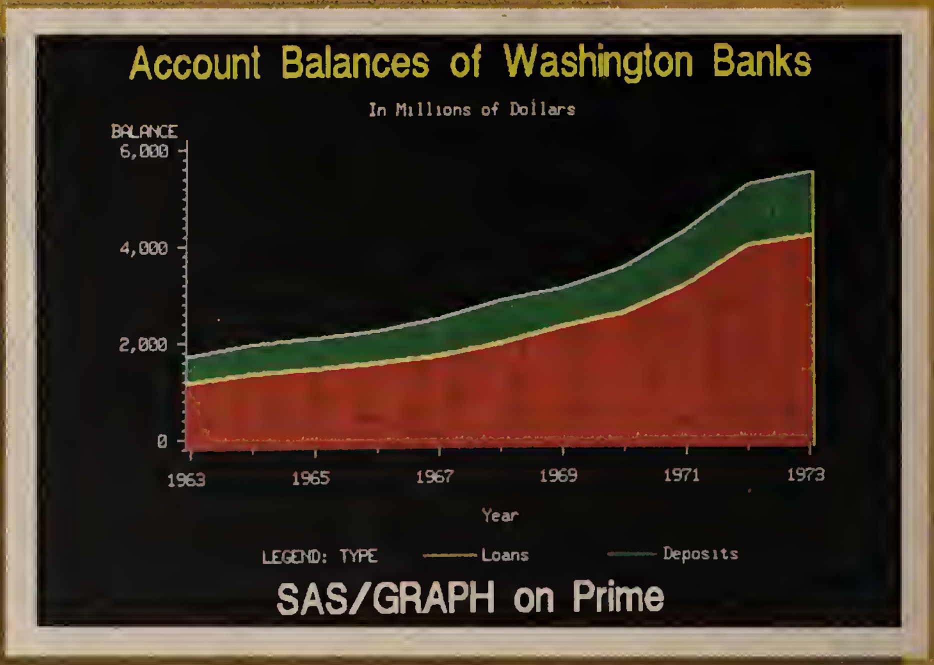

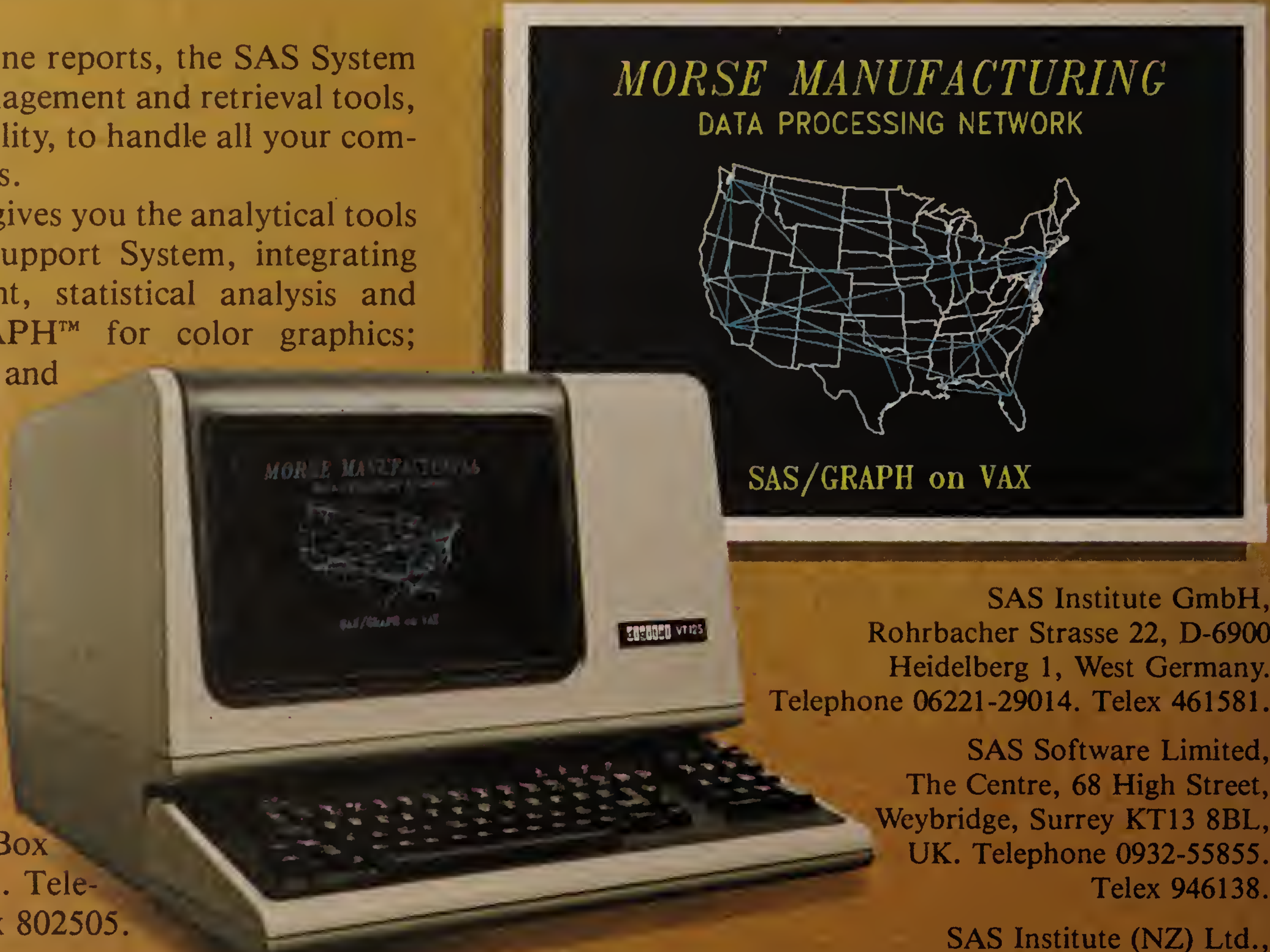

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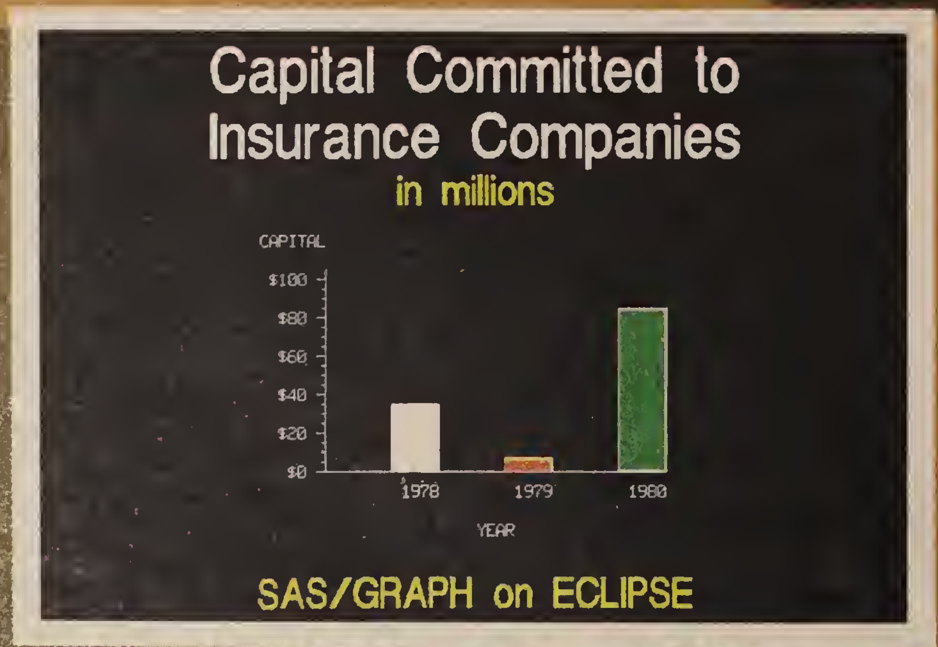

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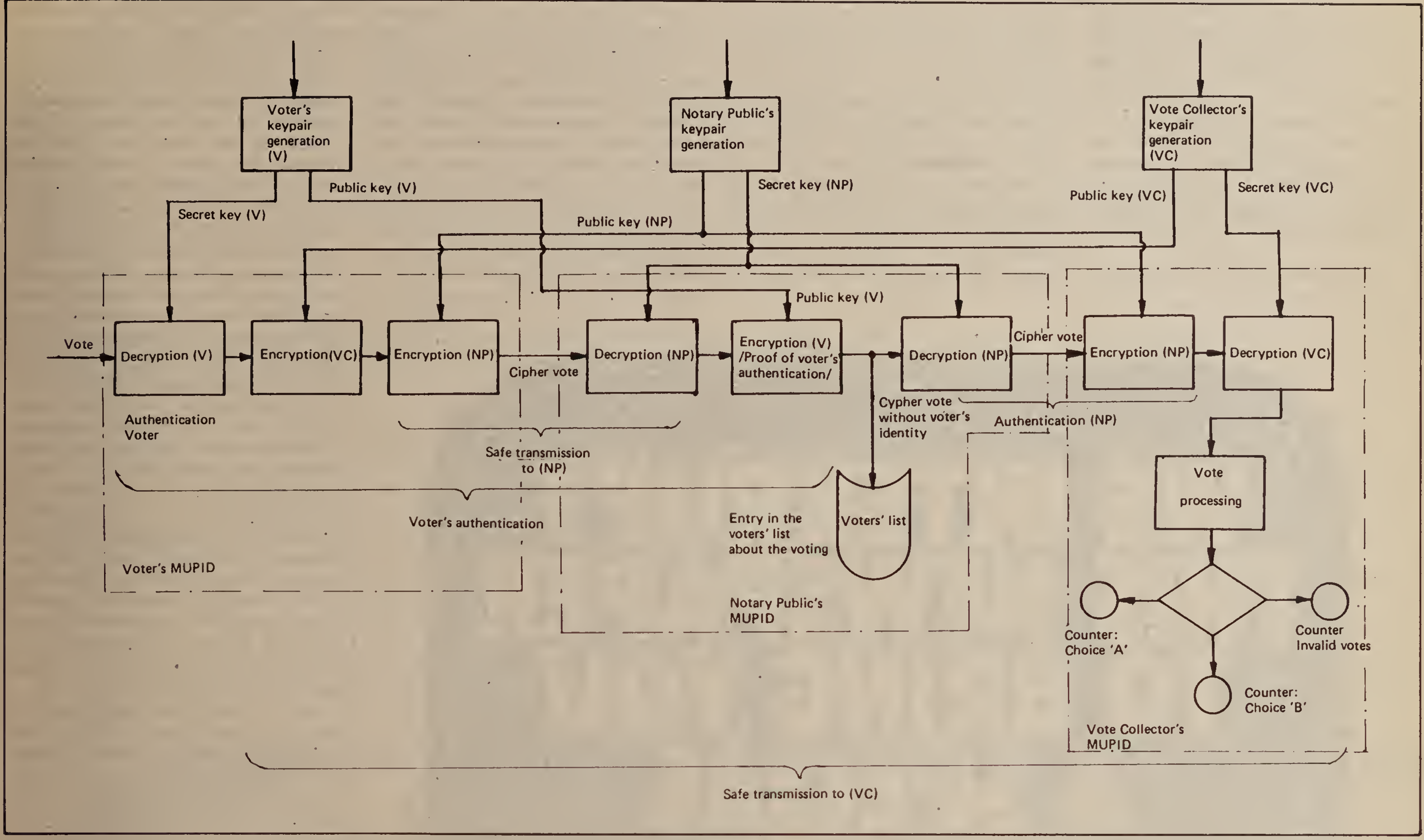

Figure 6

options is rather broad. The question is how far it is worth going in this process. Another problem is the processing capability of the intelligent video-decoder. Let us assume that the problem of key distribution is solved. According to the Rivest, Shamir and Adleman article, "A Method Obtaining Digital Signatures and Public-Key Cryptosystems" (in *Communications of the ACM*), the length of the keys used determines whether an "enemy cryptanalyst" would be able to break the method in a reasonable time period. The authors' estimates have shown that a 50-digit key could be broken by the fastest algorithms and machines of today in approximately 3.9 hours; 75-digit keys would take 104 days; 100 digits, 74 years; and 200-digit keys, 3.8 times 10^9 years (3.8 billion years).

Common sense suggests that even for the most sensitive daily applications, 75- to 100-digit keys would be sufficient. At present, however, it would be a cumbersome and time-consuming problem for microcomputers to process 75- to 100-digit keys. Mupid, for example, even with its floating-point-Basic version, can only handle 12-digit keys in the simplest programming form.

There is, however, hope on the horizon. Reportedly, microcomputer encryption/decryption software based on the public-key principle is already on the market using a 77-digit key. The software operates on Zilog Z80 microcomputers under Digital Research, Inc.'s CP/M system. The time needed to generate the encryption and decryption keys ranges from 15 minutes to four hours. The message encryption and decryption take about one minute plus the necessary disk access time. Ron Rivest, one of the fathers of the RSA public-key cryptosystem, and his colleagues are reportedly working on a single-chip implementation of the system that can be used on a microprocessor bus, which should be able to process about 150 characters per second. It seems, therefore, possible.

Electronic voting. A possible elec-

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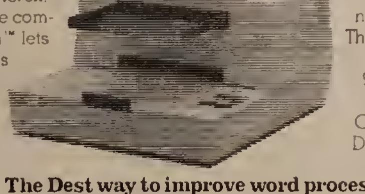

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tronic voting system built on new-generation videotex is shown in Figure 6 (on In Depth/31), although only the basic functions and links are represented. In order not to overcomplicate the chart, we have left out the videotex information files containing the appropriate piece of telesoftware needed for encryption/decryption procedures, the file of public keys and the videotex mailboxes.

As mentioned earlier, in electronic voting we have three major "actors": the voter community, a kind of "notary public" (or election board) and a so-called "vote collector." The functions of the notary public include maintaining the list of voters, checking the validity of voters and making entries in the voter's list that a vote was made by a certain voter and so forth. The notary public must also make sure that the votes are authentic and are received in time. He should not, however, be aware of the content ("yes" or "no") of the vote.

Aggregation of the votes should be done independently by a vote collector. The vote collector should basically be a third-party computer that counts the results and prepares various statistics instantaneously. The vote collector must, of course, know the content of each individual vote, but should not know who voted what. All these basic functions can be fulfilled by public-key cryptosystems as shown in Figure 6.

In our voting system, the voter's intelligent videotex decoder provides for the authentication of the voter by use of his private key, then allows the user to vote in an interactive way. It encrypts the actual vote ("yes" or "no") with the public key of the vote collector and then makes sure that the whole message, that is, his authentication (name and digital signature) and the encrypted vote, is received by the notary public safely. To achieve this, the whole voting package is encrypted with the public key of the notary public that only he can decrypt. The actual transfer of the vote is done through the message-sending service of videotex.

To process the votes, the notary public either has to use intelligent videotex decoders or, perhaps, videotex decoders combined with a third-party computer. His first function is to decrypt the votes with his private key and then to check the authentication of the voter by using the public key. If proof of user authentication is gained and the vote is formally correct, an entry then has to be made onto the voter's list to ensure that the voter does not vote again on the same issue.

At this point, the content of the vote and the identity of the voter have to be separated so that only the encrypted vote content is sent over with the videotex message service to the vote collector. In order to prove that this vote was correctly administrated by the notary public, the notary public must use his own private key to authenticate the message and perhaps even put a time stamp on it. Also, at this point, an additional encryption would assure that the transmission from the notary public to the vote collector is done secretly. This action, however, seems to be unnecessary because the actual content of the vote is still encrypted.

The vote collector is also based on an intelligent videotex decoder, and an external computer would perform the following functions: First, it checks whether the messages received were authorized by the notary public; second, it encodes the actual content of the vote with its private key and performs the vote counting and preparation of the various voting statistics. With this step, the voting chain is closed.

Since the entire process is fully computerized, any type of voting can be performed without major preparation once the whole system is set up. A national system can be installed with the technology available today.

Electronic feedback. In addition, electronic voting technically could offer other aspects on a completely new horizon, namely, voting with feedback. What do we understand this new concept to mean?

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that in a system with feedback, certain measured characteristics of the behavior of the controlled system are fed back to the controller in order to allow for adjustment in the controlling process. In a system without feedback, the controller takes controlling action on the assumption that the system will obey his controlling measures. This assumption, however, does not always come true.

A typical example taken from daily life which covers both systems is one's own daily bath. In a control system without feedback, one regulates the temperature and volume of the water in advance through the water tap with the aim, say, that after five minutes the bath is filled with sufficient water at the right temperature. All of us have certainly experienced occasions when this assumption did not work; either the water was far too hot or too cold or the quantity of water was insufficient or excessive. For this reason, a control with feedback provides much better results. One can check from time to time whether the temperature and level of the water in the bath are right.

In terms of elections, of course, the system is much more complex (Figure 7). The system to be controlled is the voting process. The controllers of the system are the individual voters, whose controlling functions are summed up in the system. The output is the aggregated results of the voting. No such voting system yet exists in which the results are fed back directly into the voting process. One of the reasons is certainly the technical difficulties encountered in doing so efficiently.

Rudimentary voting systems that do try to take feedback of a first election step into account are implemented in a number of countries. For example, in France, presidential elections are divided into two steps.

There is, however, no known system where the actual results are available to the voters during the election process where voters could modify their votes as long as the voting deadline is not past. In an electronic system as described above, this feedback would be technically possible. This set-up could mean that in a given election in which the expected results are not a simple "yes" or "no," voters would have better control over the voting process than they do today.

Here we take the election system

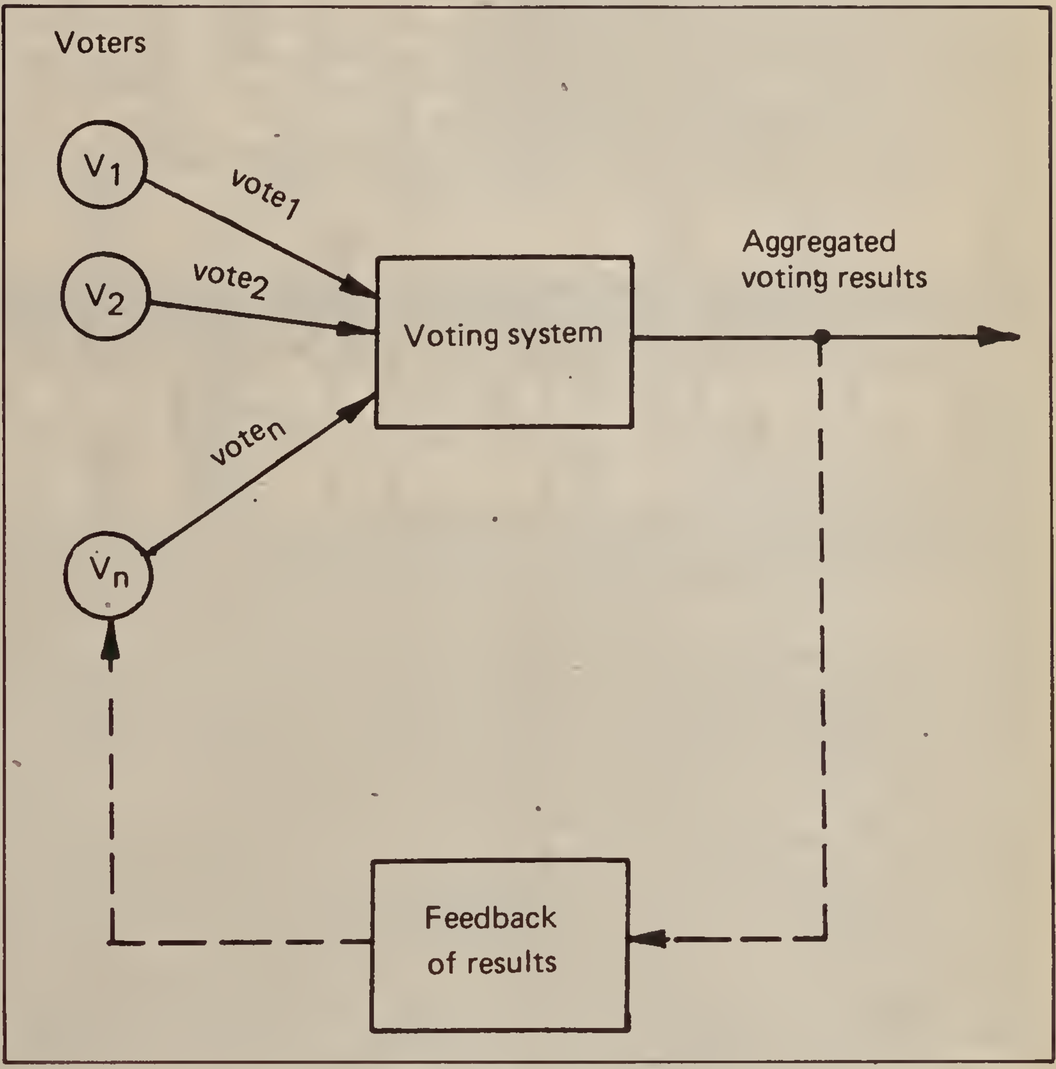

Figure 7

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of West Germany as an example. Every voter has two votes.

With his first vote, he can elect a person to represent the local community in the Bundestag for the next four years. The election process is simple. The candidate who receives the most votes wins. He is, in most cases, a member of a given political party, whose policies he will likely follow during the next term.

The second vote in this system counts in the general elections. A voter places his vote for a given party, thus basically controlling the "strength of representation" of that party in the new Bundestag. These two votes are at present the only rudimentary means available to any voter. As long as the answer is just a simple "yes" or "no," this system is fine. However, the nature of the real questions asked is much more complex and their number far more than two. In a parliament with several political parties, each with different but slightly overlapping programs, the actual questions might better be put as follows:

1. Which of the parties should be represented in the parliament and should most likely form the government? (In the Bundestag, those parties with less than 5% of the vote may not even be represented.)

2. How strongly should those parties that are elected be represented in the parliament?

For a great number of voters in the 1983 election, for example, the question was not a matter of whether they wanted to vote for party A or B, but rather, whether parties A, B, C, D and so on should even be represented and, if so, how strongly. In an interactive voting system, these questions could indirectly be asked and answered by the voters. One of the present-day fears in elections is that even after time-, resource- and energy-consuming campaigns, no real decision is reached because according to the voting results, no one government with a ruling majority can be formed.

This situation is usually deemed to be undesirable both for the party concerned and for the voter. But because of the lack of feedback in the election process, it could easily happen and does happen.

A second concern during the recent West German election campaign was those "lost" votes, which because of the 5% limit clause, could have unforeseen effects on the election process. If, for example, the smallest party now represented, the so-called "Greens," had received 6% fewer votes than they did, then the conservative party (CDU-CSU) would have obtained a majority and there would have been no necessity for creating a coalition with the Liberals. The representation share of the "left" would also have actually been severely influenced.

In an interactive system, the voters could have influenced whether the "Greens" should be "in" or "out" and if "out," who should have gotten the votes instead.

How could such a system really work? Let us take the following very simple

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scenario: An election starts at 6 a.m. on a particular day, but using the electronic voting system of videotex, some votes could have been sent to the notary public a few days earlier. Voting, as described above, could be done at home. Now let us assume that there is no feedback on the election progress before noon in order to "set the stage," but that after noon, voters could get information on the voting results through the national videotex system or some other media. Thus, every voter would have the chance to modify his vote before the close of the election.

> ***There is good reason to assume that a stable interactive voting system could, in principle, be designed and implemented if there were a political consensus supporting this approach.***

In the U.S., some interaction occurs because voting concludes and is tabulated in the Eastern states while voting is still taking place in the West's later time zones. In the 1980 election, President Jimmy Carter conceded defeat before the polls closed in the West. Political analysts believe this action influenced Democratic voters to stay home, which led to the defeat of some Democratic candidates in those states.

By this point, careful readers will have many serious questions. Yes, an interactive voting system is a complex system with dynamic behavior. In order to design a stable system with functioning feedback, the rules of control science have to be applied, and the dynamic system behavior and feedback mechanism have to be fully understood and entirely under control. This task is very complex and goes beyond the scope of this article. But there is good reason to assume that such a stable interactive voting system could, in principle, be designed and implemented if there were a political consensus supporting this approach.

Such a system could be fully implemented in the next 20 to 30 years for full penetration, provided we start to think now about how these issues and problems could be investigated and resolved and consider all the technical problems. It would seem worthwhile to carry out pilot projects on a local rather than national basis.

Thought need also be given to the political implications of such systems — whether voting will be encouraged or discouraged; whether certain classes of voters will benefit disproportionately by an interactive system; whether an interactive system will cause distortions or otherwise negatively affect the sense of equal participation; or whether a combinated system of traditional ballot plus electronic ballots for those choosing the new system will be feasible for a transitional period.

Electronic opinion polling. Technically, electronic public opinion polling is not much different from secure message sending, with or without authentication or the mechanism presented for electronic voting. Its main advantage over the presently used techniques would be that it could allow for public opinion polling results to be more quickly and frequently collected and on a larger scale than practiced today.

At present, there are still many problems associated with public opinion polling. Very often there are insufficient resources available to obtain truly representative public opinion, and usually the time span is too short to obtain decent results. It is almost technically impossible to obtain solid public opinion polling results on any current issue in two or three days at acceptable costs.

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market penetration of videotex, the citizens who could be involved easily in public opinion polling could be much larger than today. Similar to electronic voting, processing of the data can be done instantaneously, almost automatically and practically without any cumbersome data preparation.

If this instrument is applied correctly, it may provide a most valuable and powerful tool for those who are (or should be) really interested in the public's opinion.

Electronic ombudsman. The "electronic ombudsman" concept obviously does not mean that complaints could be received and investigated automatically by new information and telecommunications technologies, only that these new tools could considerably help.

The technical solution for an electronic ombudsman is rather obvious. Through the ombudsman's public key, everyone could send secret messages to him, which could either be signed through private keys or be kept anonymous. It is not possible to send an anonymous message in the present videotex systems. But should such a function be required, another independent body — let's call it the "public's representative" — could be established to put messages in an anonymous form.

The messages could be encrypted as well. The sender encodes his message according to the ombudsman's public key and sends it to the public's representative for "anonymization."

The public representative would then remove the sender's name when transmitting the message to the ombudsman. The public's representative would, of course, not necessarily be able to read the content of the message.

Problems and prospects. There are many problems to be solved before one could actually start with the above applications. From the technical point of view, an electronic speaker's corner could be started any time; only the *modus operandi*, the legal status and the costs need to be clarified.

As far as electronic voting is concerned, we are not ready at this point, even from a technical point of view, to start, but there can be little doubt that all the hardware and software problems could be solved in the near future.

We estimate that a fully operational system could be set up in about two or three years' time.

The actual problems lie in a different area. First, the user penetration of such systems takes time. Market penetration to 80% of all households in the U.S. for new media were:

- Radio in 19 years.
- Black-and-white television set, nine years.
- Color television set, 25 years.
- Telephone, 72 years.
- Cable television, projected at 73 years.

The penetration of videotex, the cheap computer network for daily life, on the market will certainly not take place any more quickly than the fastest of the above media.

For this reason, our guess would be that at least one generation (25 years) would be required to achieve an acceptable level of videotex coverage so that instant voting could be possible from virtually every household.

If full user penetration is not achieved, then a possible political concept of "more direct democracy by the citizens through new information and telecommunications technologies" could also not be achieved.

Those people who for some reason do not have easy access to videotex terminals (because they cannot afford it, because they live in remote areas with an insufficient telecommunications infrastructure, or because they do not want it) would not have an equal ability to participate with those people who do own them. We estimate that the shortest time horizon possible for full penetration and introduction of such systems would be one generation — and then, only for the most developed parts of the world. Until then, electronic voting could become one of the election alternatives, such as voting by mail or at polling booths. But its full impact would, of course, not be felt or really gained in respect to a

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more direct democracy.

In the moderately developed and less-developed countries, the penetration period is, of course, even longer. Thus, unforeseen conflicts may arise. Let us assume that more public participation and direct democracy is desired in two given countries in a future information society and that one is well-developed and the other not. Is this not yet another source of difference between rich and poor?

Another possible conflict situation could be the following. Imagine a well-developed country in which more public participation in government and more direct democracy were technically possible, but the present establishment wishes to retain the status quo in governing and restricts the introduction of technologies that would allow more citizen participation.

This situation may lead to political conflicts and changes in dynamics between government and governed.

In general, in any information-rich society with the appropriate technical infrastructure for direct democracy and public participation in governing, it will be important to consider:

1. The domain of those issues in which decisions should be made jointly with the public through increased direct democracy.

2. The domain of those issues where the opinion of the individual is requested and the results of the public polling are publicly announced but the final decisions are taken by the appropriate governmental bodies.

3. Finally, the domain where decisions are taken solely by the government without asking for public opinion (for example, in some national security questions).

Determination of the above domains could prove to be a major issue in an election campaign, depending on how each party would handle these questions if it won power.

In public-key cryptosystem applications (such as secure message sending, authentication, public opinion polling, electronic voting and so on), the administration of the public keys will also be of major importance.

In the case where the encryption/decryption key pairs are generated by the key administrator, then the administrator — and, in principle, only he — will be in a position to control all information and transactions flowing through the system.

In some countries, this control might simply not be acceptable. For these countries, the system whereby the keys are generated by the user and only the encryption key is forwarded to the key administrator might prove to be more acceptable.

However, even then the administration of the encryption keys is so important that some countries may decide in public systems that the administration of public keys should be a government monopoly, say, the PTT or some central governmental agency. In other countries, a commission somewhat independent of the government might inspire greater confidence.

Vulnerability is also a problem issue. If banking transactions, electronic voting and so forth are performed by means of public-key systems, then the vulnerability of the system and especially of the key administration is of utmost importance. A terrorist attack on a single key administration center could seriously affect the daily life of society in a way similar to the effect that a poison attempt on a city's water supply by terrorists or lunatics would have.

All in all, there are plenty of problems to be solved.

About the Authors

Istvan Sebestyen is a research scholar at the International Institute for Applied Systems Analysis in Laxenburg, Austria. He is also a guest professor at the Technical University of Graz, Austria. He concentrates in the field of new-generation videotex systems, especially intelligent videotex terminals.

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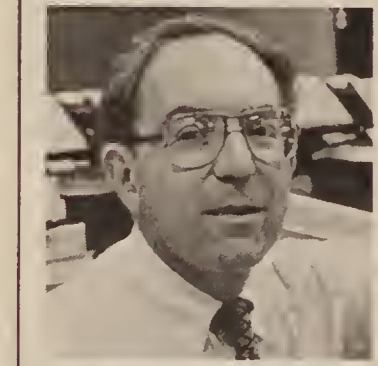
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Achieving The Promise Of the DBMS

By Carol E. Shulman

If you've ever shopped for a data base management system (DBMS), you've been promised that it will reduce data redundancy, permit more effective data sharing and provide independence among programs and data. Further, you were told that these advantages would lead to lower operating costs, lower maintenance costs, more rapid response to new requirements and an improved decision support climate.

Who could resist these tempting benefits? They strike at the heart of what most shops recognize to be some of their most important problems. Yet, although a good DBMS can theoretically yield these benefits, few users have actually achieved them.

To ensure integration and controlled redundancy, data base architectures must be planned at a high level before parceling out detailed design and implementation at the project level. This is rarely done.

Shared data bases, even at the project level, must be designed differently from application-specific files. Most DBMS users continue to use the same analysis and design methods as they used without DBMS and thus have produced one data base per application instead of multipurpose, shared data bases.

DBMS purchasers rarely have a true picture of their needs before they buy. As a result, they select a tool that turns out to be inadequate once the true needs are discovered.

The data base concept is often misunderstood and oversold. Common misconceptions include the belief that an organization should develop one gigantic corporate data base, that a DBMS will have an immediate positive impact and that it is easy to design and implement data bases that will be shared by many end users and applications.

The barriers to the effective use of a DBMS are far more political and cultural than they are technical. Effective use of a DBMS requires often dramatic shifts in the role of technicians, end users and management. It probably requires changes to the organizational structure, including the creation of some new positions. It definitely requires a lot of education. Basic disagreements about what data means, what data is required and what the priorities should be must be overcome. These barriers cannot be easily surmounted without firm, public support from upper management. And it requires the dedication of far more resources than just the DBMS purchase price. These needs are rarely addressed when a DBMS is acquired.

Most of these problems arise because the user is not really aware of certain key, hidden assumptions implied by a DBMS and the benefits it offers:

- Data is a resource separate from the programs and users who currently access it, and as such, it requires management in its own right. "Management" should be as broadly defined for data as for other corporate assets. That is, data must be planned for, acquired, monitored and controlled, just as financial assets, physical plant and human resources are managed.
- It is technically possible to design data bases that can be used for many purposes.
- It is politically, culturally and organizationally possible to plan for, design, implement and maintain shared data bases.

It is possible to ensure that these

assumptions are valid for a particular organization. Taking the time to do so increases the probability that the benefits from a DBMS will be realized. The prerequisites for data base success include:

1) Adopt the "information resource management" (IRM) philosophy and make it very visible.

2) Modify the approach to systems planning and design to include the analysis of data in its own right.

3) Establish an adequately staffed and funded data administration function with the responsibility and authority for managing data resources.

4) Acquire the proper tools, which include not only a DBMS with certain key features, but also two or three other pieces of information management software.

The IRM Philosophy

There must be widespread agreement that information is an important corporate asset and that shared data bases are a corporate goal. Until this consensus occurs, people will not recognize the need to put data through the same kind of management cycle that other resources routinely require.

There are several vehicles for developing this consensus, and the most successful ones begin by winning over top management. Some proven ways of doing this are:

- Provide some concrete examples of how the business has been affected adversely because of a lack of this orientation. For example, survey the data used by three to five applications that are central to the business and determine the extent of data redundancy and inconsistency. Try to assign costs to these problems and report findings to upper management. Or, report on two or three important decision support applications requests that proved difficult or impossible to satisfy because of unintegrated, inconsistent data. In other words, make management aware of the business impact via concrete examples it will understand and appreciate.
- Help managers educate themselves. Send them to a data base seminar or assemble a reading list of convincing articles and books. This approach works best if managers are already motivated to learn more about these issues.
- Apply some of the information planning, analysis and control techniques discussed below on a pilot basis and publicize their success. This is most effective if the pilot application has had past difficulties because of unintegrated, redundant and/or inconsistent data — and when its success is important to the people to be convinced.
- It is often true that one or two influential senior executives are more appreciative of these issues or are more receptive to learning about them. Find one, sell to him and get his help selling to the other executives whose support you require.

Help managers educate themselves. Send them to a data base seminar or assemble a reading list of convincing articles and books. This approach works best if managers are already motivated to learn more about these issues.

Once the necessary senior management understanding and commitment has been garnered, make it visible to others. Some ways this has been accomplished include:

- A statement of the philosophy in the annual report, corporate mission statement, business plan and so on.
- Articles and/or interviews with a senior manager in an in-house organization.
- Formal announcement via internal company meetings.

This type of publicity is most effective when accompanied by publicity about corresponding actions taken, such as the formation of a high-level IRM steering committee,

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the appointment of a highly placed data administrator or the allocation of budget for IRM personnel and tools. Other actions that reflect commitment include the selection of formal assignments or IRM responsibilities to upper management, end users and management information systems (MIS) personnel.

If data is to be treated as an independent resource, organizations must adopt methods for its planning, acquisition, monitoring, maintenance and retirement or replacement. There are well-tested approaches to these needs.

The more nettlesome issues are political, such as deciding who should be responsible for maintaining data timeliness and integrity in an environment where many users share the same data.

Planning is best accomplished via the construction and analysis of a model of the business' activities and the information required to perform them. This model is supplemented or extended by a corporate information architecture. This architecture identifies entities — persons, places, things and events — about which data is required; shows how they interrelate — for example, that a vendor supplies many parts or that a customer is served by one sales rep; and shows how they can be grouped into subject data areas containing information that is often used together when performing business activities. These models can and should reflect not only the current business, but also foreseeable future activities.

The best known methodologies in this area are IBM's Business Systems Planning, which is weak on the data architecture side and is sometimes insufficiently detailed to draw project boundaries with confidence, and James Martin's strategic data planning methodologies, which are a part of a approach he calls information engineering.

Acquisition in the systems world translates to detailed design and implementation. While many popular systems design methods work just fine for processes, most neglect data as something independent of applications or programs. The body of techniques for designing and implementing data bases as independent resources is called data modeling.

The good methods heavily emphasize the use of "normalized" or "third normal form" data structures because they are inherently more stable and flexible. Data modeling techniques flesh out some project-size portion of the data architecture defined during planning, adding specific attributes and interest for specific purposes, revealing new entities and associations. The result is a "logical model" or "conceptual schema" that is independent of any particular implementation technology. The conceptual schema is then translated into a structure supported by a given DBMS or file access method and then implemented.

Monitoring and maintenance in a systems context encompasses data entry, validation, updating, extraction, backup, auditing and so on. This is the phase of the data resource life cycle that is directly addressed by a DBMS. A good DBMS contains facilities to assist the user with all aspects of this phase and can indeed make it more productive and cost-effective. The more nettlesome issues are political, such as deciding who should be responsible for maintaining data timeliness and integrity in an environment where many users share the same data.

Data Administration

These techniques for information resource management work best if someone is explicitly assigned the responsibility for carrying them out. This is usually accomplished through establishment of a data administration function. Ideally, this

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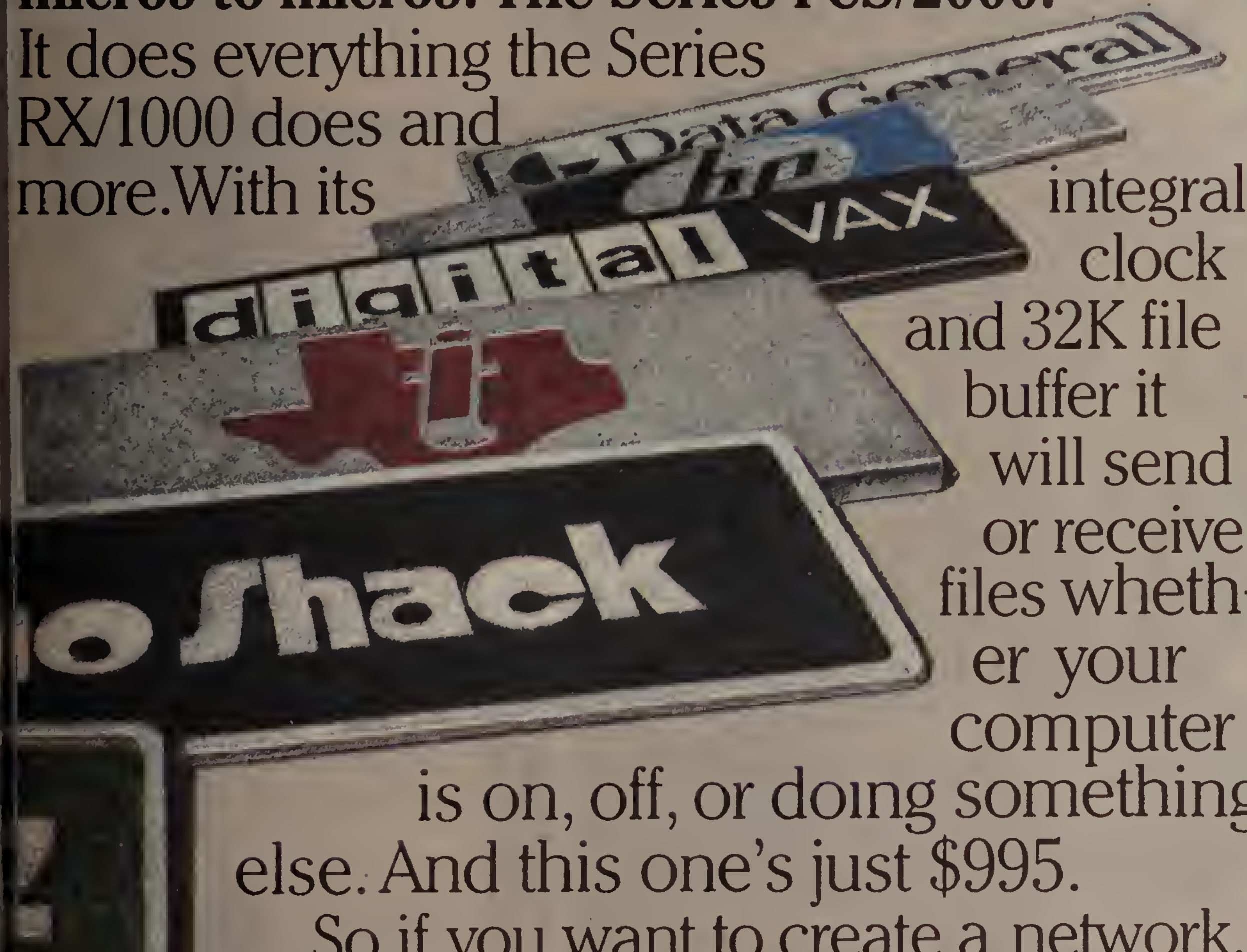

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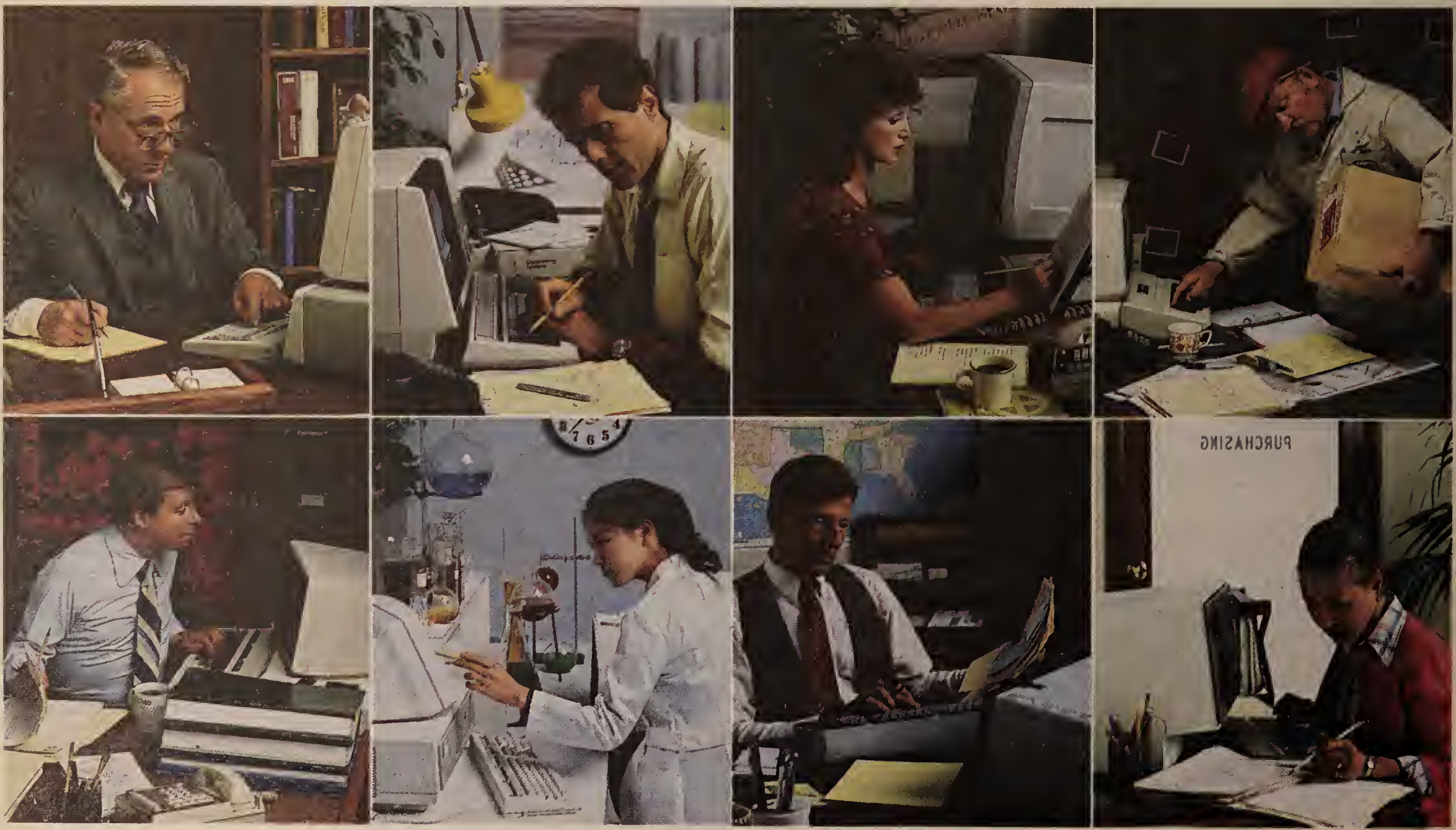

function is independent of the existing systems organization, and its senior manager has a title consistent with other senior resource managers.

In practice, this placement rarely occurs immediately; the function is created in the MIS organization and migrates up and out over time as it proves itself. User management must have explicit responsibility for supporting data administration; user managers are experts in the business and the data it requires, and the data administrator cannot function effectively without their continuous involvement.

The data administration staff will typically include the data administrator (department head); one or more data analysts, who develop the corporate architecture and associated detailed logical schemas; one or more data base administrators (DBA) responsible for designing, implementing and tuning the actual data bases; and one or more clerks, who maintain the data dictionary.

Acquire Proper Tools

Information resource managers cannot function effectively as "barefoot cobbler's children." They must manage vast amounts of data about data, and for that job they will need automated tools:

- An enterprise modeling tool to support planning.
- A detailed modeling tool to support logical data modeling.
- A data dictionary in which to record accepted entity, data item and association names, definitions, valid values, security constraints, users, uses and so on.
- A DBMS with the right features.

The planning tool should permit entry, update, analysis and review of both the activity and the entity models upon which plans are based. Ideally, it will also tie these model elements to others, such as corporate problems and goals, operating locations, formal organizational structures, project definitions and requirements. Its analysis capability should include support for clustering entities into subject data areas, distribution decision making, project boundary identification, project prioritization and support for checking the internal completeness and consistency of the models.

The logical design tool should assist in the derivation of normalized structures. (Much of normalization should be automated because it is very tedious to do manually). Most modeling tools rely on some notion of a "user view," which is a statement of localized information requirements for a specific purpose and/or user. These are then combined and normalized, and the redundancies are netted out. The result is a detailed, nonredundant structure that supports all given user-view requirements.

The tool should facilitate iterative refinement of the design and should provide both graphics and tabular reports. Ideally, it will also assist in converting the logical structure into schemata compatible with hierarchical,

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network and relational DBMS and will be integrated with the data dictionary and the planning tool.

The data dictionary should provide a robust structure for storing information about entities and attributes at all three levels: planning, logical design and implementation/operation. It should permit recording of entity and attribute names, aliases, definitions, valid values and interrelationships. It should allow storage of physical characteristics such as field length and type. It should help to keep track of where data is used, by whom and for what. It should allow reflection of security and audit constraints. It should facilitate "where-used" and impact analysis and have good search and extraction capability. Ideally, it will be tightly coupled to the DBMS and thus provide capabilities like automatic data validation, security enforcement and calculation of derived values.

The DBMS itself should offer maximum independence of data and programs. That is, there should be few kinds of data structure changes that require recoding of programs that used the old structure; the DBMS should help in easily restructuring and identifying programs that may be affected. Its underlying model (hierarchical, network or relational) should be readily compatible with the corporate data architecture. (Note that hierarchical systems almost never are.)

It should be able to handle problems associated with multiple users, which implies deadlock resolution capability; strong access security; performance tuning aids; access and change logging by user; support for a large number of subschemata; and interfaces with a variety of host languages, file access methods, inquiry and reporting tools and so on.

It should assist in maintaining data integrity — which implies strong data validation facilities — audit trails and restart/recovery utilities. It should free the user from having to know the details of physical data structure to access the data. That is, it should provide relatively automatic data base navigation.

Data base management systems solve a large piece of the technical puzzle of how to control data resources. However, to achieve the true potential they offer requires organizational commitment, new analytic methods, new organizational structures and more tools than just a DBMS. It also requires patience. It takes several years of orchestrated development to achieve shared, nonredundant, stable data bases.

Before buying a DBMS, consider developing at least a portion of an enterprise model and corporate information architecture. This exercise can be invaluable in identifying DBMS requirements and making good use of the product you choose.

About the Author

Carol E. Shulman is director of marketing for Database Design, Inc. in Ann Arbor, Mich., a consulting, education and software firm specializing in information resource management.

SCIENCE/SCOPE

Landsat 4 is being used to study toxic waste disposal sites in the northern part of San Francisco Bay. NASA scientists are using data from the Earth resources satellite to study water quality, stress on vegetation, land use, soils, surface geology, and topography around more than 20 existing and abandoned disposal sites. One objective is to determine criteria for buffer zones around the sites. Providing data is Landsat's multispectral scanner, an imaging instrument built by Hughes Aircraft Company and its Santa Barbara Research Center subsidiary.

Military commanders who previously relied on second-hand information now can get vital data instantly through a new communications terminal. The ground-based terminal is connected to a display console to show surveillance information provided by E3A early-warning radar aircraft and the Joint Tactical Information Distribution System (JTIDS). Unlike previous terminals, which are operated as part of a full command and control network, the new terminal can give second- and third-echelon commanders the situation in their immediate vicinity. The new Hughes terminal, called a Stand-Alone, can be transported easily and set up in an existing facility, or installed in a small shelter or command vehicle.

A network of small "smart" radios will let U.S. troops and their commanders know where they and friendly forces are located at all times. With the Position Location Reporting System (PLRS), combat troops will no longer have to seek landmarks to pinpoint their location. PLRS automatically supplies position and navigation data in digital form through a computerized communications network that displays data on a small hand-held box. PLRS units can be mounted on vehicles, aircraft, and helicopters. All units serve as automatic relay stations, so that units far away from a master station can stay in touch regardless of terrain or weather. Hughes is producing PLRS for the U.S. Army and Marine Corps.

Much as a TV picture is made, the newest U.S. weather satellite can create a full portrait of Earth in about 18 minutes. GOES-6 (Geostationary Operational Environmental Satellite) views the western U.S. and the Pacific from its orbital slot 22,300 miles above the equator. While the satellite's antennas remain fixed and pointed toward Earth, its body spins at 100 rpm for gyroscopic stability. Housed in the spinning portion is the picture-taking instrument, which makes a west-east scan of Earth one line at a time. On each scan, the instrument's mirror steps down 1/100th of a degree. Some 1,800 scans are needed for a full-disc image of Earth. Hughes built GOES-6 for the National Oceanic and Atmospheric Administration as part of the World Weather Watch project.

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NMS System Improves Management Of Networks

NASHVILLE, Tenn. — Northern Telecom, Inc. has introduced Network Management System (NMS) to improve control and administration of data communications networks. NMS is compatible with most existing data network controls and management systems and permits expansion as new products enter the market. It is an integrated, modular processing system that allows for centralized control of the switching, test and performance subsystems that handle data network test and control functions, a vendor spokesman said.

NMS allows both local and remote control of fault detection, problem isolation and service restoration. The system's Master Control System makes extensive use of color and graphics and analyzes and stores network data based on priorities determined by the user, a vendor spokesman said.

The price for NMS ranges from $100,000 to $1 million, depending on the configuration. Each system is tailored to the user's individual needs. More information is available from Northern Telecom at 259 Cumberland Bend, Nashville, Tenn. 37228.

Availability of TMMS Marks First IBM-Rolm Cooperative

SANTA CLARA, Calif. — Rolm Corp. recently announced the availability of the IBM Telephone Message Management System (TMMS) on the Rolm VLCBX private branch exchange (PBX) — marking the first integration of products between the two companies since the announcement of a joint product development agreement in June.

TMMS enables businesses requiring personal telephone answering capability to provide callers with information about an employee who is out of the office. When users leave the work place, they enter information concerning their destination, phone number, estimated time of return and other information.

The attendant can enter messages that users can retrieve from terminals throughout the work site, a Rolm spokesman said.

Integrating the messaging system with the PBX is said to enhance the capabilities of TMMS. For example, when a user is away from the desk, the PBX forwards calls to the TMMS attendant and automatically displays the user's profile on the attendant's terminal.

The attendant then can input messages into TMMS for callers or transfer the callers to the Rolm Phonemail voice messaging system so they can leave their own private recorded voice messages.

With either decision, the PBX notifies the called users that a message is waiting by activating the message-waiting indicator/lamp, which is standard on Rolm telephones, the spokesman said.

"This is the first concrete example of Rolm and IBM cooperative efforts, and we look forward to many more," according to Bob Maxfield, Rolm executive vice-president and general manager of the Office Systems Division.

Further Rolm/IBM design and development ventures will be forthcoming, a Rolm spokesman said. These projects will include efforts to define and support standards for communications among central computers and office equipment such as PBXs, telephones, terminals and personal computers.

Rolm will market the TMMS system through its own operating companies and independent distributors. It will be available on the VLCBX system beginning in October of 1984.

The suggested end-user price for a 200-user system including message display station will be approximately $115,000, Rolm said from 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

To Triple Termination of SDLC Lines

NCR Comten Unveils 3650 Models

ST. PAUL, Minn. — NCR Comten, Inc. has announced models of the Comten 3650 front-end and remote communications processor said to allow the unit to terminate up to three times the number of IBM Synchronous Data Link Control communications lines at the processor and support two hosts without an expansion cabinet.

In addition to the newly designed processor, two models of the Comten 3650, Models R8 and S8, were announced to support up to 16 communications lines, 512K bytes of memory and two hosts.

The models will be available in early 1984 with prices starting at $41,000 for a Comten 3650 configured as a front-end or remote communications processor with 256K bytes of storage, operator console, IBM channel program loader and communications interface for four communications lines.

Further information can be obtained from NCR Comten, which is located at 2700 Snelling Ave. N., St. Paul, Minn. 55113.

FCC Chairman Explains Effect of AT&T Breakup

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — For anyone trying to understand the complex situation now facing communications users anticipating the breakup of AT&T, the testimony of Federal Communications Commission (FCC) Chairman Mark Fowler at a recent House of Representatives hearing is a good place to start.

Analysis

Appearing late last month before the House government operations subcommittee, Fowler explained that mainly because of regulatory constraints, AT&T and other telephone carriers have had to charge too much for long-distance service. As a result, they have lost business to lower priced competitors such as MCI Communications Corp.

To right this imbalance, Fowler said, the FCC has removed the chief regulatory restraint — the requirement that long-distance users pay a substantial percentage of local telephone costs. Under the FCC's much-discussed access charge plan, these costs will be borne by local as well as long-distance users.

Fowler stressed that this

(Continued on Page 92)

Western Union Providing Teletex Between U.S. and West Germany

UPPER SADDLE RIVER, N.J. — Western Union Telegraph Co. announced recently that it has begun providing Teletex service both domestically and between the U.S. and West Germany.

Teletex, developed in West Germany and introduced there in 1981, combines text typing and processing with automatic memory communications, a company spokesman said. It reportedly operates at 2,400 bit/sec, about 45 times faster than standard telex message transmission, and is said to deliver a one-page message from one terminal to another within seven seconds, either domestically or overseas.

According to Thomas Mathai, Western Union vice-president of Office Message Services, "Teletex service represents the latest advance in electronic mail, combining high-speed communications with memory and text editing capabilities."

Announced last year [CW, Aug. 30, 1982], the service may also transmit and receive messages between any of the 1.5 million telex subscribers throughout the world through interconnection with Western Union's Worldwide telex service.

The service reportedly conforms to all CCITT international standards for message transmission. A Western Union spokesman said that several terminal vendors have introduced terminals that comply with CCITT standards.

The switching equipment for the service is a Siemens Corp. Electronic data switching circuit switch located in New York. That equipment reportedly establishes real-time connections between Teletex-compatible word processors or electronic typewriters located in the U.S. or overseas. Additionally, the switch buffers speed difference, converts code and routes messages originated from a Teletex terminal to domestic and overseas telex stations.

Using a compatible terminal, messages can be composed and stored in memory for immediate or later transmission to the memories of other Teletex machines, the spokesman said. Terminals will automatically acknowledge receipt of incoming messages and store them so that typing need not be interrupted.

Western Union said the first commercial user is Siemens Medical Labs of Walnut Creek, Calif., which transmits messages to the company's Medical Systems Group in Erlangen,

(Continued on Page 75)

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TORRANCE, Calif. — Local Data Co. has announced Filelynx/3278 software, which interfaces an IBM Personal Computer to IBM mainframes, providing fully automatic file and transfer. and 3278 emulation at up to 9,600 bit/sec.

The software allows users to transfer an entire file to or from the IBM mainframe automatically. File transfer support is flexible, allowing a variable number of lines per screen to be transferred, along with support for formatted screen applications, a vendor spokesman said.

Filelynx/3278 works exclusively with Local Data protocol converters and requires a minimum of one serial card, 64K bytes of memory and any version of IBM's PC-DOS operating system. The price is $200.

Local Data is located at Suite 706, 2701 Toledo St., Torrance, Calif. 90503.

Net System Monitors PBX Output

ATLANTA — Contel Data Services Corp. has announced a network management system for monitoring output from digital central offices and private branch exchanges/private automatic branch exchanges (PBX/PABX).

The Network Management and Administration Center (Nemac) system is a package comprised of software, services and a Honeywell, Inc. DPS 6 superminicomputer, a spokesman said.

According to the vendor, central office types currently monitored include Northern Telecom, Inc.'s DMS 10, DMS 100, DMS 100/200 and SL-1 Digital PABX; Stromberg-Carlson's DCO; and Nippon Electric Co.'s NEAX-61.

A typical application monitoring 10 central offices or PABXs would cost about $450,000. More information is available from Contel Data Services, 245 Perimeter Center Pkwy., Atlanta, Ga. 30346.

Teletex Available Overseas

(Continued from Page 73)

West Germany.

Users of the service will be charged a $300 monthly fee and usage costs of 85 cents per single page and 35 cents per additional page domestically and $1.34 per single page and 84 cents per additional page between the U.S. and West Germany.

More information is available from Western Union at One Lake St., Upper Saddle River, N.J. 07458.

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Modem Released For Metro Areas

WHEELING, Ill. — Gandalf Data, Inc. has introduced a 9,600 bit/sec medium-distance modem designed for metropolitan point-to-point data transmission.

The LDM 409 is an autoequalized, microprocessor-controlled medium-distance modem designed to meet synchronous, full-duplex data transmission requirements at 9,600 bit/sec within metropolitan areas.

It operates in constant carrier mode on four-wire voice grade lines or four-wire loaded or unloaded twisted pairs. Diagnostic loopbacks, a test pattern generator and error detector are provided for testing, a vendor spokesman said.

The LDM 409 will be ready for shipment in December and is priced at $1,175, the vendor said. Gandalf Data is located at 1019 S. Noel, Wheeling, Ill. 60090.

For Use With AT&T's DDS

Codex Offers Data Service Units

MANSFIELD, Mass. — Codex Corp. recently announced two data service units designed for use with AT&T's Dataphone Digital Service (DDS), as well as two multiple modem "nest" enclosures for the 5000 series of card modems and an automatic calling modem.

The firm also unveiled a cable multiplexer for use with IBM 3270 display systems.

The 8500B Data Service Unit (DSU) is said to be the functional equivalent of the Bell Laboratories DSU 500, offering an additional feature of switch-selectable synchronous data rates of 2,400 bit/sec, 4,800 bit/sec and 9,600 bit/sec. For high-speed communications, a company spokesman said, the 8556 DSU operates at a synchronous data rate of 56K bit/sec.

The 5016R modem enclosure reportedly houses up to 16 modems and an automatic calling unit in 5¼ inches of vertical rack space and has a maximum power consumption of 30W. The 5008R modem enclosure is said to provide high-density packaging of Bell 208A/B and 212A card modems and occupies seven inches of vertical space in a standard 19-in. electrical equipment rack.

The 5212/Automatic Calling Unit (ACU) modem reportedly has the capability to communicate with any personal computer, dumb Ascii terminal or front-end processor. The vendor said it incorporates all the software needed for a full range of communications capabilities.

Prices for the products are: 8500B, $725; 8556, $810; 5016R, $750; 5008R, $1,500; and the 5212/ACU is available for $645.

The cable multiplexer reportedly supports up to 32 type-A IBM terminals and printers over a single coaxial cable to an IBM 3274 controller. In a point-to-point configuration, the multiplexer reportedly combines data from a 3274 controller via a single coaxial cable.

Terminals can reportedly be placed up to 2,952 ft from the cable multiplexer unit and linked to another unit located up to an additional 4,920 ft away.

Priced at $1,100 for a stand-alone unit and $3,350 for the 32-port unit, a spokesman said, the multiplexer is available from Codex, which is located at 20 Cabot Blvd., Mansfield, Mass. 02048.

Lear Siegler Unveils ADM 12

ANAHEIM, Calif. — Lear Siegler, Inc. has introduced a video display terminal said to fill the niche between the company's ADM 11 and ADM 24E.

The ADM 12 is said to feature a tilt-and-swivel mechanism that allows the operator to direct the screen, a low-profile keyboard and long-coiled cord.

The ADM 12 reportedly can store data in a horizontal 158-col. by 24-line format, which can be scrolled back and forth across the screen. Word processing applications are handled by the vertical 80-col. by 48-line page. The terminal is also said to provide 16 programmable, nonvolatile function keys, which can be shifted to perform 32 functions.

Priced at $895, the terminal is available from Lear Siegler at 714 N. Brookhurst St., Anaheim, Calif. 92803.

Gilnet Enables Users to Communicate With IBM JES2, JES3, Compatibles

READING, Pa. — Gilbert/Commonwealth has announced the availability of Gilnet, a remote job entry workstation system, to those who need to communicate with computer systems.

The system supports IBM's MVS operating system and can run up to 99 simultaneous workstations in one MVS address space. Each workstation emulates one card reader, one printer, a card punch and a console. The system communicates with IBM JES2, JES3 and compatible services.

The price is $10,000 from Gilbert/Commonwealth, P.O. Box 1498, Reading, Pa. 19603.

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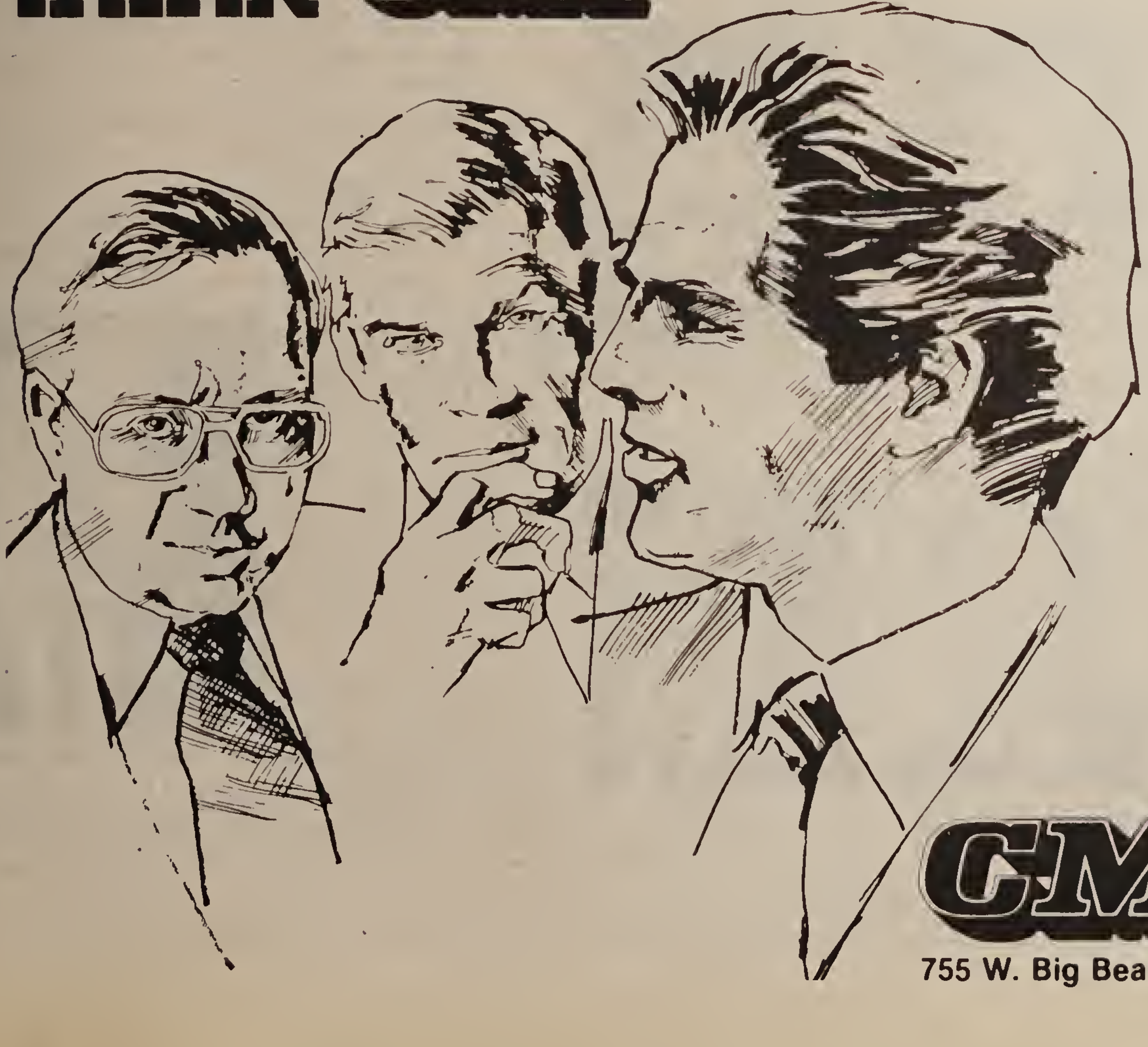

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INTECH '83 features a new concept in session presentation with this theater-in-the-round approach. The Integration Theater is a unique and special format ideally suited for the world-class speakers and the panels and sessions to be held here. These internationally renowned consultants and their topics include:

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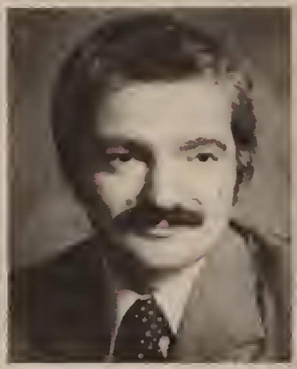
- Arnold Roberts, President, ADC Associates
  "Selecting a Personal Business Computer"
- David Friend, Special Consultant
  "Graphics: New Management Solutions"
- Will Zachman, VP,
  Technology Assessment, IDC
  "Microprocessor Impact on Systems and Uses"
- Dr. Howard Frank, President,
  ConTel Information Systems, Inc.
  "Local Networks: Before You Get One"
- Dr. Howard Morgan, Chairman,
  Advanced Office Concepts
  "Solving DP/WP Integration Problems"
- Edward Horrell, President,
  Mitchell & Horrell, Inc.
  "Integration through CBX Technology"
- Dr. John McQuillan, President,
  McQuillan Consulting, Inc.
  "Strategic Planning for Integration — Who, How, When & Why"
- Harry Newton, President, The Telecom Library
  "Personal Career Advancement Through Embracing Office High Technology"

Arnold Roberts, President
ADC Associates

David Friend,
Special Consultant

Will Zachman, VP
Technology Assessment, IDC



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Dr. Howard Morgan, Chairman
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Conferences

Professional seminars and discussions concerning state-of-the-art-technologies will be led by the foremost experts in the field. It is the first time so many of the best and most renowned industry speakers will be gathered together under one roof to discuss the integration of communications, office automation and data processing.

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Here's a sampling of the general session topics:

- *"Satellite Networks"*
- *"Network Intelligence"*
- *"The Multifunction Workstation"*
- *"Pilot Projects: Corporate PC Acceptance"*
- *"MIS — OA: Resolving the Conflicts"*

Edmund B. Fitzgerald, President of Northern Telecom, Ltd. will speak on "Business Integration — the Vision and the Reality."

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Keynote Speaker:
John Diebold — internationally acknowledged expert and founder and chairman of the Diebold Group, Inc. Mr. Diebold will speak on "Integration: A Corporate Effort."

Exhibits

There will be over 400 exhibits by leading information companies with the latest vendor architecture and technologies available. Special time is set aside for conference attendees to view all the exhibits and talk first-hand to the vendors.

Here are just some of the fine companies you can expect to see exhibiting at INTECH '83: Apple Computer, Inc., Applied Data Research, Inc., AT & T Information System, Inc., Computer Automation, Cullinet Software, Inc., Data General Corporation, Datapoint Corporation, Digital Equipment Corporation, Exxon Office Systems, Inc., Grid Systems Corporation, ITT World Communications, Inc., Lanier Business PRoducts, Inc., Lee Data Corporation, NCR Corporation, Prolink Corporation, and Telautograph Corporation.

Exhibit hours are 12:00-6:00 p.m. Tuesday, 10:00 a.m.-6:00 p.m. Wednesday, and 10:00 a.m.-5:00 p.m. Thursday.

In-Depth Tutorials

On October 31 some of the nation's leading consultants take the platform for a full day's formal instruction. These four concurrent in-depth tutorials include lecture notes, lunch and a reception with the speakers.

A — *"Corporate PC Management"* —
Dr. Michael Hammer, Hammer & Co.

B — *"Advanced CBX Applications"* —
Edward Horrell, Mitchell & Horrell

C — *"Local Area Networks"* —
Dr. Ken Thurber & Dr. Harvey Freeman, Architecture Technology Corp.

D — *"Strategic OA Planning"* —
Dr. John McQuillan, McQuillan Consulting

Each of these tutorials promises to provide a hard-hitting look at areas that are essential to the success of every information systems oriented executive.

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Package Allows TI Micro to Act as Workstation

DALLAS — Texas Instruments, Inc. has announced a software emulation package said to allow the TI Professional Computer to act as a workstation in a TI Business System series minicomputer configuration. The program allows the TI Professional Computer to emulate a standard 931 video display terminal on a Business System 300, 600 or 800 series minicomputer.

The TI Professional Computer can be attached to a Business System through either a direct-connect, switched or dedicated link. It requires a minimum of 128K bytes to run the emulation, plus a communication card for direct connect, and either an internal modem or a communication card with an external modem for a switched or dedicated link.

Both Ascii text and binary files can be transferred between stations, according to a vendor spokesman. Applications written for the Professional Computer cannot be run on the Business System's host computer, and vice versa, but programs may be stored in any location and transferred to a compatible system for execution.

The 931 emulator runs under the Microsoft, Inc. operating system MS-DOS 1.25 and sells for $150. Users with a current TI software subscription agreement can receive the emulation software built in to the DX10 3.6 and Dnos 1.2 Business Systems operating systems at no extra charge. Information is available through TI's Data Systems Group, P.O. Box 402430, H-671, Dallas, Texas 75240.

UTX-1200/5000 Family Enhanced

ST. LOUIS — United Technologies Communications Co. has announced a data enhancement for its UTX-1200/5000 family of telecommunications systems, as well as smaller and larger configurations of its UTX-1001 simultaneous voice and data systems.

The data enhancement, designated the UTX-1200/5000D, provides transparent use of the private branch exchange wiring for data transmission through a universal information channel called the Info/TAP. The Info/TAP device accepts a minimum of three RJ-ll modular jacks from either digital telephones or data interface devices.

Concurrent with this enhancement, United Technologies has released a software package which allows a UTX-1200/5000 user to continue to use its multifunction telephones and standard analog telephones.

New capabilities of the package include digital trunking, forced account codes and an intercom and buzz feature, according to a spokesman for the vendor.

The new configurations in the simultaneous voice and data series include the UTX-501, which provides businesses requiring between 100 and 350 lines with simultaneous voice and data capabilities. The system runs on ac power and has a maximum of 512 ports.

The cost of the data enhancement for the UTX-1200/5000, which will be available in the third quarter of 1984, ranges from $600 to $800 per installed line, depending on system configuration and software. The UTX-1001, UTX-501 and UTX-1001E all cost between $700 and $1,000 per installed line depending on configuration and software and are available immediately from United Technologies at 12101 Woodcrest Executive Drive, St. Louis, Mo. 63141.

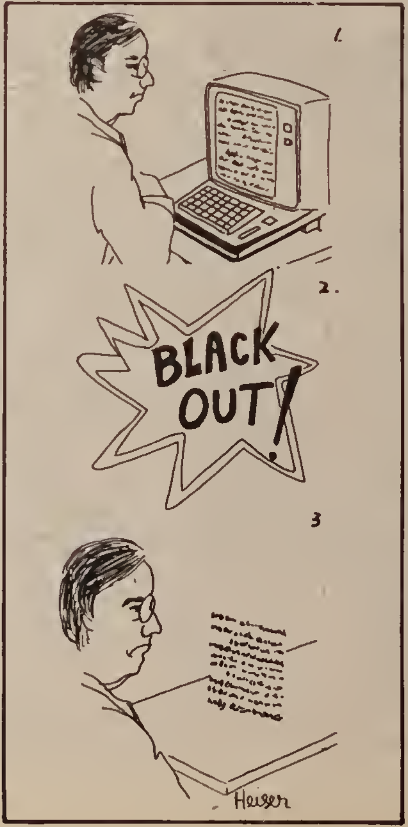
Preston Scientific Unveils Conversion System

ANAHEIM, Calif. — Preston Scientific has introduced a high-speed, multichannel, analog-to-digital conversion system that features 1-Mhz conversion rates, 15-bit resolution and multiplexing capabilities for up to 128 channels.

Designated the GMAD1A-15B, the rack-mounted system is available for both single and multichannel applications. It is equipped with a sample-and-hold amplifier and can be ordered with as many as eight simultaneous sample-and-hold channels in a single chassis or up to 128 channels in a multiple-channel system.

In addition, the multichannel GMAD1A-15B can include from 16 to 128 channels of single-ended or differential analog signal multiplexing.

The GMAD1A-15B can be assembled in synchronously driven analog-to-digital converter-per-channel configurations. The basic system costs approximately $10,000 from Preston Scientific, 805 E. Cerritos Ave., Anaheim, Calif. 92805.



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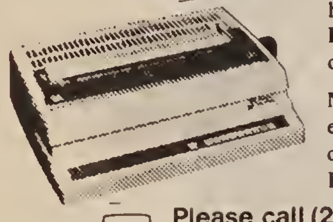

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For High-Performance Graphics Mart

Range of Displays Announced

CAMBRIDGE, Mass. — Westward Technology, Inc. has announced a range of displays aimed at the high-performance graphics terminal market.

The 1015 has been developed for applications where the quality of display is very important but high resolution is not critical, such as education, numerical control and business graphics, the vendor said.

All the displays are adjustable for viewing-position angle and tilt, and the detached keyboards and joysticks incorporate palm rests. Some options include hard-copy devices, tablets, joysticks and additional local graphics processing power.

Options for the 2015 and 2019W include a high-speed vector generator and a range of high-level local graphics commands.

The 1015 costs $3,250, the 2015 is priced at $6,250, and the 2019W costs $10,950. Further information is available from Westward Technology, 5 Cambridge Center, Cambridge, Mass. 02142.

Release 6.2 Of Falcon Unveiled

CULVER CITY, Calif. — Phoenix Computer Corp. has announced Release 6.2 of Falcon, an on-line data entry system designed to run under IBM's MVS, VS/1, DOS/VS(E) and DOS/MVT (VSE) operating systems.

The new facility allows users to transfer formats via tape rather than through the process of manually reentering the formats.

A range checking feature allows users to specify a range for numerical data. A new table maintenance facility allows data entry operators to have data values automatically substituted from predefined data tables.

Table maintenance also provides the user with a listing of all resident tables and statistics on the amount of memory allocated to tables, the number of bytes in use and the number of bytes still available for use.

The price of the system is $19,500. Further information is available from Phoenix Computer, 11949 Jefferson Blvd., Culver City, Calif. 90230.

Plessey Unit Introduced

IRVINE, Calif. — An eight-color terminal said to emulate Digital Equipment Corp.'s VT100 and VT52 terminals was recently announced by Plessey Peripheral Systems, Inc.

The vendor said that by using color in 64 programmable combinations, the Plessey PT-600 improves user response time, shortens training time and simplifies graphics and data sorting.

It reportedly combines video features such as variable-speed smooth scroll, split-screen and window erase with functional capabilities such as hexadecimal key pad mode, a vendor spokesman said.

The terminal is priced at $2,995 by the Distributor Products Division, Plessey Peripheral Systems, 2632 Du Bridge Ave., Irvine, Calif. 92714.

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Avanti's new T1 UltraMux.

It lets you take maximum financial advantage of low-cost T1 tariffs. Using UltraMux, you can replace up to 128 lines with one T1 line. Plus, you can have additional voice circuits, increased data transmission rates and more capabilities, too.

The UltraMux sends voice, data and video in any combination. That means the UltraMux can handle your telephone communications, data transfers and video teleconferencing. The system's high bandwidth, up to 10 Mbps, means you can use satellite, private microwave and fiber optic communications links now and T1C and T2 links as they become available.

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Select the exact channel configuration you need; up to 64 synchronous or voice channels; 128 asynchronous channels. Maximum channel speed can go as high as 8.2 Mbps, and you can digitize voice at 16 or 32 Kbps.

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The UltraMux is flexible enough to expand as you do. Its modular interface works with whatever communications equipment you now use, and can easily adapt to future needs as well.

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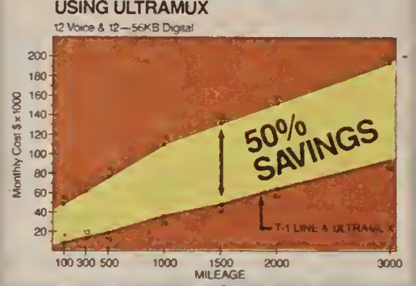

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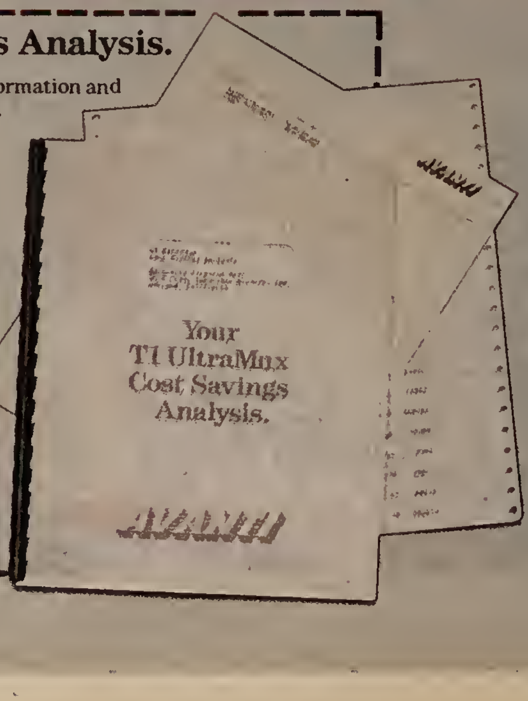

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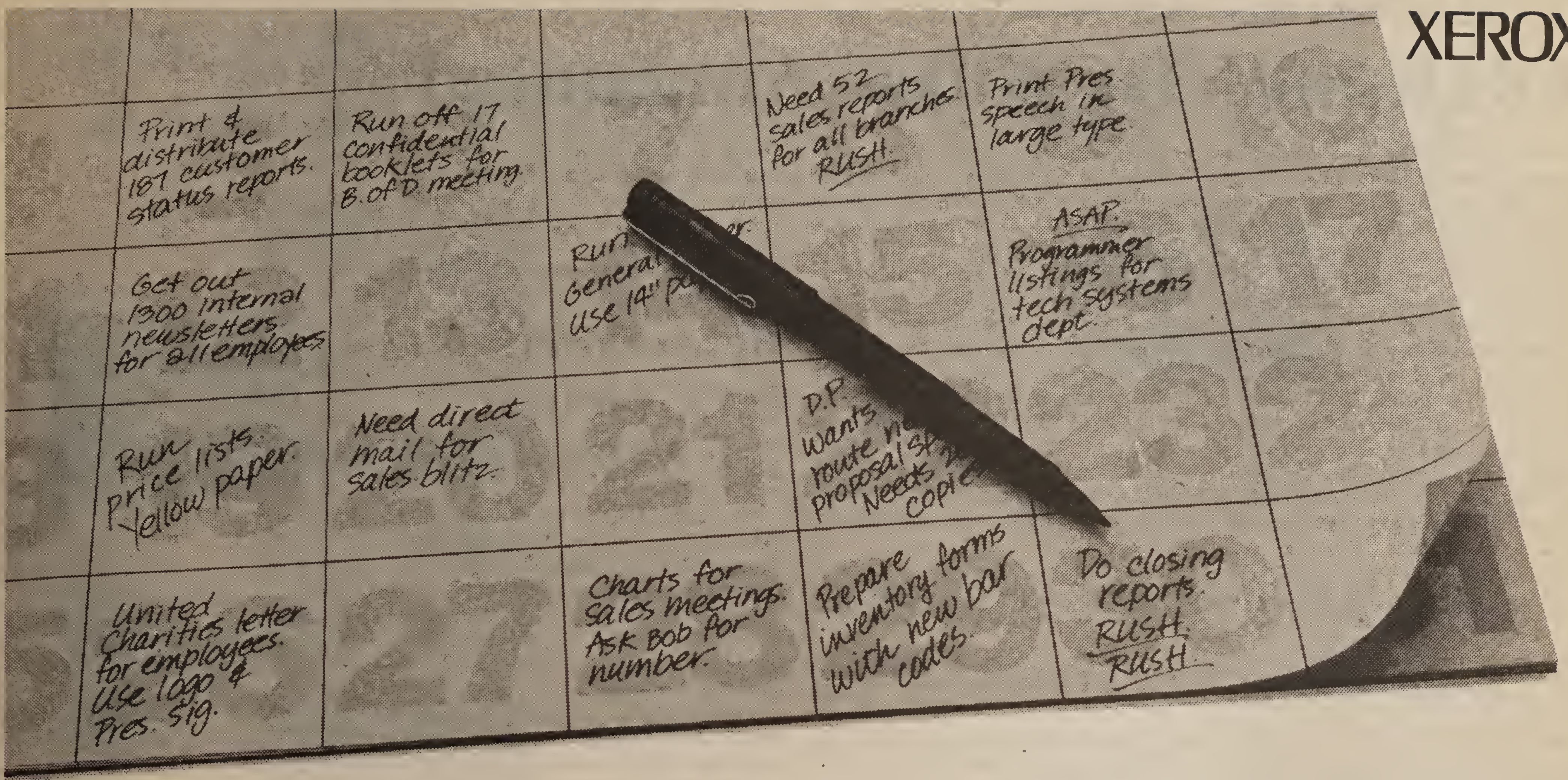
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*This offer is only available through our standard lease plans. It expires on December 31, 1983.

Provides Data Base Access

'DG/Gate,' 'DG/Blast' Announced

WESTBORO, Mass. — Data General Corp. recently announced a software package enabling users of its systems to gain access to public data bases and another package said to allow low-cost file transfers among DG computers and between many popular microcomputers.

DG/Gate is a terminal emulation package enabling users of DG systems to access public data bases as well as other DG systems and other computers with DG/Gate software, a company spokesman said. The package functions on DG's Rdos, AOS, AOS/VS and Desktop Computer operating systems.

DG/Blast software runs under Rdos, AOS and AOS/VS and reportedly allows file transfers among computers using the product. The vendor said it also permits file transfers between DG/Blast-equipped computers and other vendors' computers that are running Communications Research Group, Inc.'s Blast utility along with Digital Research, Inc.'s CP/M 80 or CP/M 86 or Microsoft Corp.'s MS-DOS.

DG/Gate is priced at $150 for Desktop Generation units and from $1,000 for other systems; DG/Blast is priced at $200 for Desktop Generation units and from $1,000 for other systems. Delivery is 60 days, and more information can be obtained from Data General, Small Business Systems Division, 4400 Computer Drive, Westboro, Mass. 01580.

Teltone Modem Allows Users To Enter Data Via Touch-Tone

KIRKLAND, Wash. — Teltone Corp. has introduced a smart modem that allows users to enter computer data from a remote Touch-Tone telephone without using a terminal, as well as accepting standard computer-to-computer data transmissions.

The Teleport 300 modem also accepts a sophisticated password security system to prevent unauthorized access. It is compatible with the Bell 103 protocol and offers standard features such as auto/answer/originate.

Conventional computer-to-computer data transmissions are possible at terminal data speeds ranging from 75 to 9,600 bit/sec.

A user can also call into the system from any Touch-Tone telephone, enter a log-on password via push button code and enter data into the computer system using Teleport 300's DTMF-Ascii conversion capability, a vendor spokesman said.

The Teleport 300 will be available in late December at a price of $349 from Teltone at 10801 120th St. N.E., Kirkland, Wash. 98033.

Bytex Offers ISCC Option For Autoswitch

FRAMINGHAM, Mass. — Bytex Corp. has announced the Intelligent System Control Console (ISCC) option for the Autoswitch system.

ISCC utilizes the IBM Personal Computer XT with a 320K-byte floppy disk, a 10M-byte hard disk and a color CRT console.

Features include a menu/function key control, extensive security functions based upon user ID logon, preprogrammed command sequences initiated by a single function key, time-based commands, event/alarm-based command, multiple backup configuration storage and on-line event and user file storage.

The price is $12,900. More information is available from Bytex at 2 California Ave., Framingham, Mass. 01701.

Coders Enhance Transmissions Of Satellites

SAN DIEGO — M/A-COM Linkabit, Inc. recently announced a family of forward error correction coder/decoders said to improve satellite transmission system performance significantly by lowering the energy required to achieve high performance.

The Convolutional encoder/Viterbi decoder families reportedly enable European single-channel-per-carrier earth stations to achieve low bit error rates that enable the use of smaller antennas and smaller power amplifiers, the vendor said.

The units start at $3,950. Further information is available from M/A-COM Linkabit, 3033 Science Park Road, San Diego, Calif. 92121.

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ADP Autonet Introduces Data Transportation Service

ANN ARBOR, Mich. — Automatic Data Processing Network Services, Inc. (ADP Autonet) has announced its Autowats data transportation service, a host interface arrangement.

The service was designed to eliminate the host interface equipment charges that low-end users find difficult to justify, the vendor said.

Some features of the service include features of the Autonet public data network, such as local dial-up access by terminal users and fully error-corrected network data transmissions.

Autowats is available in all Autonet domestic access cities and supports terminal speeds up to 1,200 bit/sec. Charges are based on a monthly access fee and an hourly usage rate that includes connect and data transmission.

Further information is available from ADP, 175 Jackson Plaza, Ann Arbor, Mich. 48106.

Atlas Release 2 Announced

PRINCETON, N.J. — Mathematica Products Group, Inc. has announced Release 2 of its Atlas data communications monitor, featuring simplified programming and support of the vendor's Ramis II fourth-generation language.

Release 2 also offers support for IBM's Vtam and Btam networks, as well as IBM's Systems Network Architecture. The monitor is designed for use in the IBM DOS/VSE operating system environment, according to a vendor spokeswoman.

Priced at $28,000, Atlas is available from Mathematica Products Group through P.O. Box 2392, Princeton, N.J. 08540.

Autobaud Plus Fits Prime Systems

WOOD DALE, Ill. — Computronics, Inc. has introduced Autobaud Plus, said to allow a Prime Computer, Inc. system to determine the bit/sec rate that a terminal is using.

Autobaud Plus features the support of all Prime 50 series systems, a spokesman said. Autobaud Plus can reportedly be used with any Bell-compatible 212 series, Racal-Vadic, Inc. 3400 series or other multispeed modems.

Autobaud Plus can also reportedly be used with 300, 1,200 and 2,400 bit/sec modems. It costs $110 from 130 N. Ash, Wood Dale, Ill. 60191.

Protocom P2500 Out for Users Of Uniscope

STAMFORD, Conn. — Protocom Devices, Inc. recently announced a packet assembler/disassembler said to enable users of Sperry Corp.'s Uniscope to access Ansi X.25 packet-switched networks.

The Protocom P2500 reportedly has four physical ports permitting the connection of 40 devices using the Uniscope protocol. Features include advanced data streaming, network security techniques and a full set of error-detection and correction features, a spokesman said.

The P2500 is priced at $9,500. More information is available from Protocom Devices, 207 Atlantic St., Stamford, Conn. 06901.

Dial-Up Link Transmits Data From France

SAN JOSE, Calif. — A French electric company has established an intercontinental dial-up link to the U.S. for high-speed data transmission through the Anderson Jacobson, Inc. subsidiary in France.

The link uses an Anderson Jacobson 4048 full-duplex, dial-up modem with statistical multiplexer at both ends of the line and makes high-speed full-duplex operation over two-wire lines possible, the vendor said.

The unit costs $24.95 and is available from Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

Display Station Out, Compatible With IBM 3270

COSTA MESA, Calif. — MDS Trivex has introduced the 8078 Model 5 display station, which is plug-compatible with the IBM 3270 and can reportedly be connected to a Trivex 8074, an IBM 3274 or 3276 controller.

Standard features include a Sunflex glare-reducing screen filter, the choice of a 75- or 87-key keyboard and the ability to function in a bisynchronous or IBM Systems Network Architecture/Synchronous Data Link Control environment, according to a spokesman for the vendor.

The price for the 8078 Model 5 is $2,350, the vendor said. It is available from MDS Trivex, 3180 Red Hill Ave., Costa Mesa, Calif. 92626.

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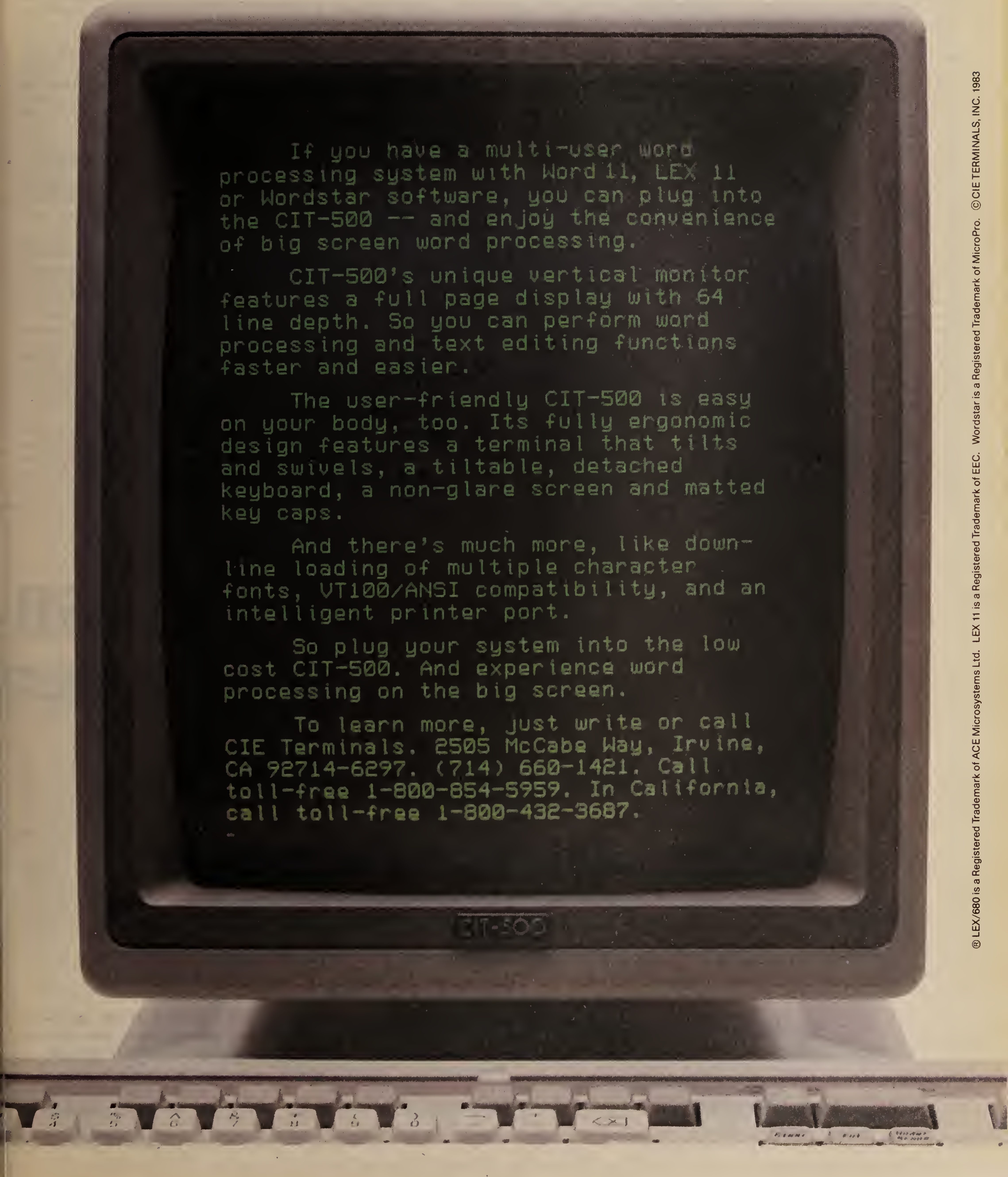

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What to Expect From AT&T Breakup: FCC Chief

(Continued from Page 73)

1984 by between 10% and 15% for all residential customers and businesses," he told the subcommittee, chaired by Rep. Glenn English (D-Okla.).

The FCC chairman neglected to mention that the transfer of local exchange access costs from long-distance to local users also will enable AT&T Communications (formerly AT&T Long Lines Division) to gain ground on its competitors.

Today, about 2.5% of the long-distance contribution to local exchange service comes from other common carriers, such as MCI, that carry approximately 5% of the long-distance traffic. Under the FCC's access charge plan, this contribution increases to 3.3% next Jan. 1.

Since it will have to contribute less, AT&T should be able to charge its customers less; the other common carriers, on the other hand, will be paying more and will have to charge more. This shift is particularly significant since the access facilities which local telephone carriers make available to the carriers will not begin to improve until 1985, and it will be at least a couple of more years before the improvements are widespread.

There is a good deal of evidence to suggest that AT&T will benefit far more from the FCC's plan than will its customers. Fowler, in his recent appearance before the English subcommittee, talked at length about the reduced long-distance rates which the plan will generate.

"Our staff estimates that as a result of this shift in cost recovery, interstate long-distance rates should decrease in 1984 by between 10% and 15%," he said. But whether costs actually come down that much for business users, who are intended to be the chief beneficiaries, appears unlikely at the moment. AT&T's newly proposed long-distance rates will reduce charges about $2 billion [CW, Oct. 10], but the FCC-mandated access surcharge on Message Toll Service (MTS) — as in dial-up interstate telephone service circuits — will total an estimated $3.3 billion in 1984.

Private-Line Rates to Rise

While AT&T has proposed substantial cuts in its MTS usage charges, private-line usage rates would rise an average of 15.3%. For certain popular business services, the increase would be far greater.

One way that users might mitigate these increases is by migrating to facilities that bypass the telephone network. However, the FCC plan discourages that option by imposing a surcharge on leased lines which connect a user to long-distance net facilities.

Pending legislation goes even further. A House of Representatives bill imposes a surcharge on "any transmission facilities or services used as a substitute for voice-grade or equivalent transmission facilities or services," and a Senate measure contains similar language. As a result, wideband circuits such as Dataphone Digital Service, technically capable of being carved up into voice circuits, are subject to the surcharge.

Fowler told the subcommittee that some curbs on bypass are necessary, because without them "large interstate toll users . . . can avoid the public network." He added, however, that congressional efforts to broaden the bypass tax "could hinder technological development and impede productivity in the telecommunications industry."

Actually, there is a question whether any tax on bypassers is necessary. Just because a business user has to pay more to the telephone company for long-distance service will not automatically cause him to migrate to another supplier. In many cases, his existing long-distance traffic is traveling over circuits that also carry local message traffic, and it would be uneconomical to reduce the latter even if the cost of the former might be reduced.

Another consideration is the cost of building bypass facilities; relatively few companies can justify such an investment. Leasing facilities from a bypass carrier would get around that problem, but few such carriers are actually operating today.

The big argument for taxing bypassers is that the number of nontelephone bypass carriers is likely to grow significantly in the next few years. But slapping a surcharge on the alternate facilities and artificially increasing their price is believed to be inconsistent, considering that the FCC access surcharge plan and the pending legislation are both ostensibly aimed at benefiting users, not telephone companies.

Another approach might be to insist that the local carriers build competing facilities that would employ microwave, cable and the other high bit-rate technologies that are currently being employed by the bypassers.

Alpha Unwraps Software Version For Apple IIe

BURLINGTON, Mass. — The Alpha Software Corp. has brought out a version of its Apple Computer, Inc.-to-IBM software that supports the Apple IIe.

Alpha said the program, which transfers data files between the Apple II and IBM's Personal Computer, is now compatible with Apple's communications card and the CCS 7110 card from California Computer Systems, Inc.

It is currently available for $250, according to a spokesman from Alpha, which is located at 12 New England Executive Park, Burlington, Mass. 01803.

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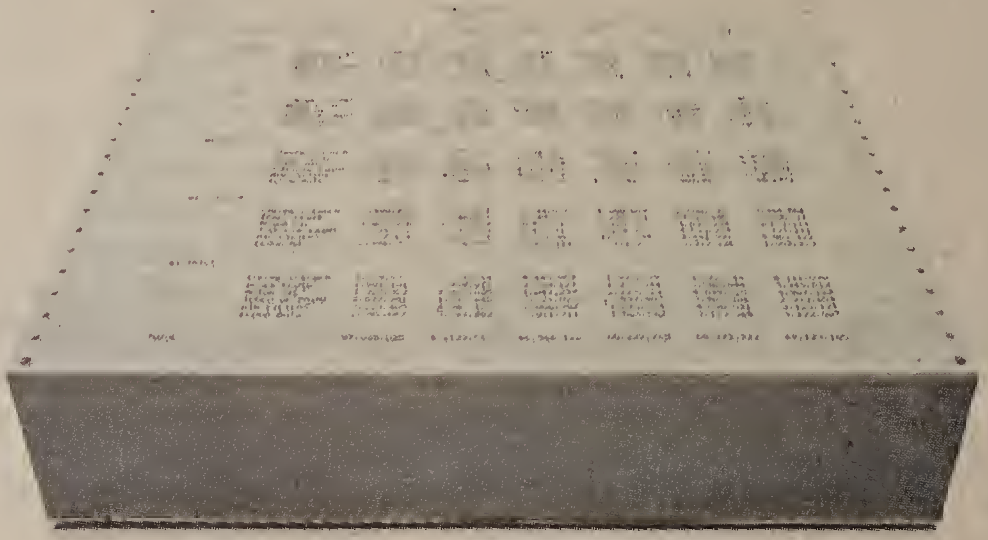

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Kaufman Unveils Converter Supporting Varied Devices

MOUNTAIN VIEW, Calif. — Kaufman Research Manufacturing, Inc. has introduced a modular protocol converter said to support many types of asynchronous devices on from one to eight channels, each with its own microprocessor.

The Model 870 converts IBM Binary Synchronous Communications protocols, including Systems Network Architecture/Synchronous Data Link Control, into asynchronous, emulating the IBM 3270 cluster controller. The Model 871 converts Sperry Corp. Uniscope protocol into asynchronous, emulating the Univac UTS 400.

A microprocessor on each channel gives the advantages of faster asynchronous conversion, which is especially important in the Univac model because of timing constraints, and the capability of support for 256 terminals per host by the Model 870 and 248 terminals per port by the Model 871.

Cost of a basic system, including on-line interface, is $3,395. Each additional module costs $700. An optional adapter, priced at $50, makes the system rack mountable. More information is available from the vendor at 145 E. Dana St., Mountain View, Calif. 94041.

Multiplexer Cuts Costs By Combining Voice and Data

CHERRY HILL, N.J. — Datatel, Inc. has introduced the DCP9100, a multiplexer that reportedly reduces communications costs by combining up to 48 voice and data lines over a single telephone communications carrier facility.

Datatel's microprocessor-controlled T1 multiplexer data channels may be synchronous or asynchronous at speeds as high as 896,000 bit/sec.

The DCP9100 includes test and monitoring capabilities as standard equipment.

Test pattern generators and detectors facilitate troubleshooting without the need for external test equipment, a spokesman for the company said.

Prices for the DCP9100 multiplexer start at $3,200 for the base unit, the vendor said. Each input channel costs $325 per end, with delivery in 30 to 45 days.

Additional information is available from Datatel, which is located at Cherry Hill Industrial Center, 1998 Springdale Road, Cherry Hill, N.J. 08003.

Network Meet Set For Nov. 2-3

NEW YORK — A two-day seminar on data communications network alternatives is scheduled for Nov. 2-3 at the Plaza Hotel here by Probe Research, Inc.

The seminar, titled "New Data Communications Network Alternatives," will explore the demand for data communications.

The seminar registration fee is $795. More information is available from Probe Research through Box 590, Morristown, N.J. 07960.

HP's 3000 Line Gets Reporting Capability

READING, Pa. — The Dash Group, Inc. has announced the PMS/3000 system, which the company said provides reporting capability to monitor and control private branch exchange (PBX) utilization for users of Hewlett-Packard Co.'s HP 3000 line of computer systems.

According to the company, input to the system comes from a PBX, which generates message accounting information.

The company said the reports are designed to locate problem areas quickly, and the system capabilities include reporting on extension usage including department summaries, reporting on usage of trunk lines and trunk groups, exception reporting, call detail reporting and long-distance detail reporting and lost call summaries.

The cost for the PMS/3000 system is $10,000, including training and maintenance.

Information is available from Dash Group, P.O. Box 8666, Reading, Pa. 19603.

PBX Conference Dates Scheduled

NEW YORK — A "Private Branch Exchange (PBX) Strategy Conference" sponsored by the marketing service group at S&R Consultants Ltd. will be held here Oct. 4-5 and in San Francisco Oct. 12-13.

The conference will feature analysis of leading PBX systems on the market. Conference leaders will be S&R's John Madrid of the marketing programs and services group; Spencer Rice, president of Futuristic Communications Consultants, Inc.; and Allan Sulkin, senior partner at S&R Consultants Ltd.

The registration fee for the conference is $695. More information is available from S&R Consultants, Suite 303E, 200 Park Ave., New York, N.Y. 10166.

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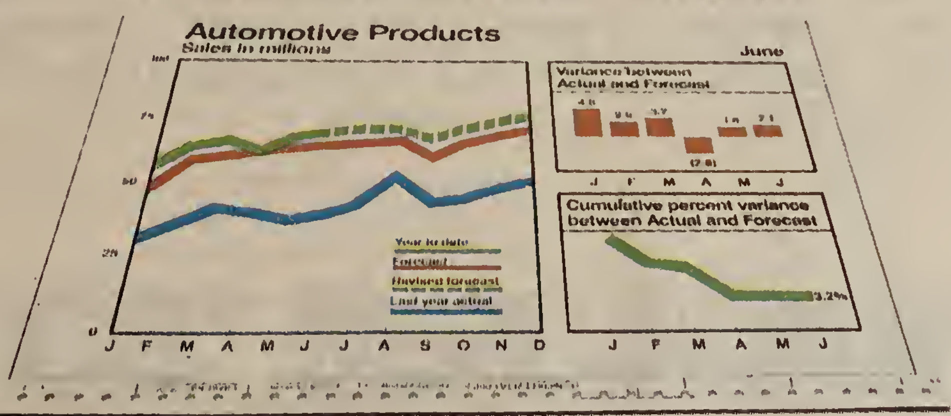

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Canadian Net-Based Unit Debuts in U.S.

NEW YORK — A four-year-old Canadian maker of electronic components made its first U.S. appearance as a computer vendor here last week, unveiling a distributed system based on a local-area network.

Dy-4 Systems of Ottawa introduced the system it calls Dynasty, a setup that will support up to 64 workstations connected to 4,000 feet of cable and running on three operating systems. The product will make its formal debut at Comdex in November.

Garry Dool, president of the $5 million company, said the firm's success as a maker of semiconductor-on-thermoplastic-on-dielectric circuits — a gating device favored by the process control industry — had encouraged it to fashion a whole system around its board-level component.

"Where the rest of the people are trying to bring the micro up to the capability of a system, we brought the mainframe down," Dool boasted.

The distributed network will run on Digital Research, Inc.'s CP/M 2.0, Unix Version 3 and Microsoft, Inc.'s MS-DOS, Dy-4 executives said.

The company, which has installed 76 of the systems, with all but one of them in its home country of Canada, is gunning at a market of systems integrators, especially those with customers in education, government, business and the process control industry.

But Dool was quick to add that the vendor looks at large corporation DP managers as in-house systems integrators.

"They are a special case of systems integrator, but to our minds they are still systems integrators. The people who pay them are the end users," Dool said.

Even so, the company plans to engage in only a "very limited" direct sales campaign, Dool admitted. Still, Dy-4 has opened a sales office in Campbell, Calif., headed up by Carlo Bruno, former marketing director at Zilog, Inc.

David Thomas, the firm's systems researcher, explained the new product as "a distributed operating system which you may package with our boxes or you may package with IBM [Personal Computer] boxes. We're not in the business of selling cable," he said.

Dool added that the system would soon support Digital Equipment Corp. personal computers as well. "We don't foresee adding [Apple Computer, Inc.]. The demand just isn't there," he said.

System users share data storage and peripherals such as printers and modems, Thomas said. Each workstation can run its own operating software, independent of the network, he added.

"The backbone of the system is [Corvus Systems, Inc.] Omni-Net. We go through Omni-Net hardware," Dool said. Though Omni-Net is a Corvus Systems product, Dy-4 manufactures the interface card to create the network.

A typical setup, with 32 stations and 192K bits of memory, will sell for $25,000 a station. Availability of the multiple operating system version will be in January.

Dy-4, a private company that raised $2.5 million in its third investment drive last May, is based in Ottawa.

Boasts High-Density Recording Tech

CCG Offers Tape Subsystems

COSTA MESA, Calif. — California Computer Group, Inc. (CCG) has introduced two magnetic tape subsystems said to feature high-density group coded recording technology, which packs data at 6,250 bit/in.

Designed to be integrated into Digital Equipment Corp., Data General Corp., Texas Instruments, Inc., Perkin-Elmer Corp. or Hewlett-Packard Co. minicomputers, the subsystems reportedly offer savings in cost per 1M byte of backup data storage.

The drives are interfaced through a variety of controllers, including those made by Emulex Corp.; Western Peripherals, Inc.; Rianda; Spectra Logic Corp.; Macrolink, Inc.; or Dylon Corp. The choice of controller is determined by both the CPU host and by the price/performance criteria the user requires, the vendor said.

The two subsystems are the Storage Technology Corp. (STC) Model 2920 Avalanche dual-density drive (1,600/6,250 bit/in.) and the Kennedy Co.'s tridensity Model 9400 (800/1,600/6,250 bit/in.)

Single-unit pricing for the STC 2920-based subsystem starts at $11,300. The Kennedy 9400-based subsystem starts at $12,100 in single units. CCG is located at Suite G-10, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

The Minicomputer's Future: Will It Survive?

By Efrem G. Mallach
Special to CW‡

My sixth-grader used a Radio Shack TRS-80 to review state capitals last year. The mother of one of his best friends writes articles on a Xerox Corp. 820. Moving several steps up the scale, we see the Synapse Computer Corp. N+1, Convergent Technologies, Inc. Megaframe and their ilk supporting hundreds of on-line users. The micro seems to be everywhere.

However, the massive supercomputers are not endangered. There will always be jobs that consume all available power and users who can afford to run them. Large mainframes are not an issue.

The question that is usually asked concerns minicomputers. What is their future? Can they survive? To find out, let's go back a few years.

> *'All else being equal, as you put more elements on a chip, the elements slow down. As a result, the mini can be more powerful than the micro. . . . However, micros will be more cost-effective where they suffice.'*

Minis arose in the mid-1960s during a search for the simplest combination of logic modules that could do reasonable computations. The answer was generally a clean architecture. It may have lacked many features of higher priced systems, but was extremely cost-effective where it sufficed.

A decade later, the same attitude sparked the micro revolution. As technology made logic cheaper, minis had grown more complex. They didn't get fat and lazy — there was too much competition for that to happen — but they were no longer the simplest possible computing device. There was room for a new player to slide under them, and the micro did.

A microprocessor is a single integrated circuit that contains all the logic circuits of a central processor. It has tens of thousands, or perhaps a few hundred thousand, individual circuit elements. It was designed for the sole purpose of executing programs coded in a particular instruction set. Used for that, a microcomputer, as we'll use the term here, is a computer that uses a microprocessor as its CPU.

A mini, on the other hand, has a CPU that's built up of more general-purpose elements. Rearrange them and you can get a

(Continued on Page 100)

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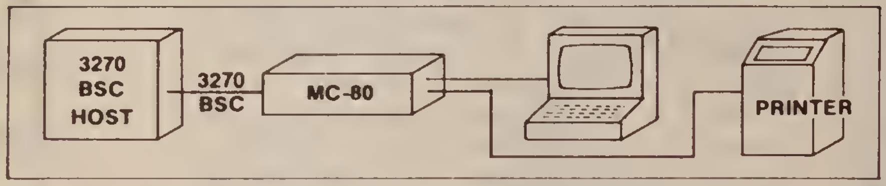

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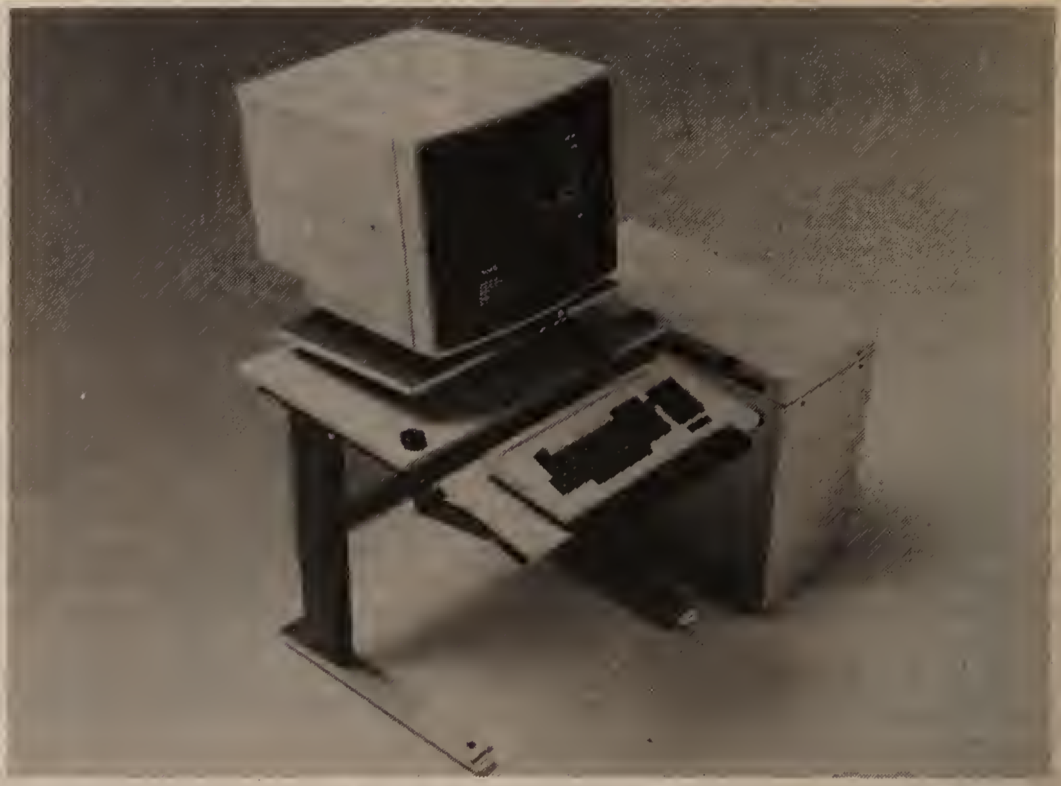

Megatek's Whizzard 3355

Megatek Offers Graphics System, Price Reductions

SAN DIEGO — Megatek Corp. has announced the Whizzard 3355, a medium-priced, two-dimensional graphics system said to offer a direct migration path to functional three-dimensional applications.

Also announced were price reductions, effective immediately, on its Whizzard 7200 computer graphics system and 1645 and 1650 desktop design terminals. The vendor described the price cuts as "aggressive positioning to increase market share."

The Whizzard 7200 family of graphics systems, which includes five models, has been reduced approximately 20% in price.

Because of the wide range of options available, prices for the systems vary.

The 1650 engineering terminal, previously priced at $14,900, now costs $9,900. The 1645 is now priced at $8,900, down from $13,900.

The Whizzard 3355 reportedly provides a full range of graphics functions with a high-resolution, color raster display and built-in, real-time dynamic transformation power, combined with Digital Equipment Corp.'s VT100 emulation for addressing nongraphics functions. It is software-compatible with the Whizzard 1600 and Whizzard 7200 families through Megatek's Wand and Template software.

The system features Megatek's Graphics Engine; the vendor's local processor with host interface, which supports local memory management, user tasks and high-speed data transfer; and a resident 16-bit microprocessor with local random-access memory to offload the host computer.

Also, it can locally perform the complex graphics transformations needed for rotating two-dimensional displays, as well as translations, continuous scale, zooming and windowing, the vendor said.

The Whizzard 3355 is priced at $22,500, with first shipments scheduled to begin in the first quarter of 1984.

Megatek is located at 9605 Scranton Road, San Diego, Calif. 92121.

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Today's New Systems . . .

THE TELIDON BOOK: DESIGNING AND USING VIDEOTEX SYSTEMS, David Godfrey and Ernest Chang, editors
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THE COMPUTER COOKBOOK: HOW TO CREATE COMPUTER SYSTEMS THAT WORK FOR YOU, 1983/1984 EDITION, William Bates
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INFORMATION SYSTEM DESIGN, Cyril H. P. Brookes, Philip J. Grouse, D. Ross Jeffery, and Michael J. Lawrence
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DESIGN REVIEW METHODOLOGY FOR A DATA BASE ENVIRONMENT, W.H. Inmon and L.J. Friedman
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IBM BASIC FOR BUSINESS AND HOME, Robert Funkhouser
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CP/M ASSEMBLY LANGUAGE PROGRAMMING, Ken Barbier
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A PROGRAMMER'S NOTEBOOK: UTILITIES FOR CP/M-80, David E. Cortesi
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OFFICE AUTOMATION PRIMER: HARNESSING INFORMATION TECHNOLOGIES FOR GREATER PRODUCTIVITY, C. Mullins and T. West
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THE COMPUTER COLORING BOOK: IT'S NOT JUST A COLORING BOOK, Alan Freedman and Eric Jon Nones
This playful minicourse describes the world of computers with 25 eye-catching illustrations and 50 definitions. A great teaching tool for kids!
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SMALL BUSINESS COMPUTERS: A GUIDE TO EVALUATION & SELECTION, R. Isshiki
Learn to evaluate and select small computers with greater ease and confidence. Covers important management decisions regarding feasibility, economics, and installation.
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THE VISICALC APPLICATIONS BOOK, Jack Grushcow
How to use VisiCalc in six key business areas: credit control, financial statement analysis, forecasting, budgeting, cash management, and portfolio management.
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CP/M-Based Micro Unveiled

SUNNYVALE, Calif. — Televideo Systems, Inc. has introduced an 8-bit Digital Research, Inc. CP/M-based personal computer equipped with a high-capacity Winchester disk drive and powerful graphics functions.

The TS803H system reportedly is suitable for a variety of applications in small and medium-size businesses. In addition to its capabilities as a stand-alone system, the TS803H can be linked to other 8- and 16-bit Televideo microcomputers in the vendor's Personal Computer Network.

System features include a Zilog, Inc. Z80A microprocessor; 64K bytes of random-access memory, expandable to 128K; two RS-232 serial ports for a modem and printer; and a half-height 5¼-in. Winchester disk drive with 10M bytes of storage along with a 500K-byte, half-height 5¼-in. floppy disk drive. Also included is Digital Research's GSX-80 graphics driver software, a high-resolution, 640- by 240-pixel display on a 14-in. display and a CP/M-80 operating system.

The TS803H is priced at $3,995, which includes word processing, electronic spreadsheet and business graphics software applications, according to a vendor spokesman. Televideo Systems is located at 1170 Morse Ave., Sunnyvale, Calif. 94086.

Optical Scanner Said To Fit Any CAD/CAM

ENGLEWOOD, Colo. — Xyztek Corp. announced a combination high-speed, high-resolution optical scanner and pen plotter said to complement any computer-aided design and manufacturing (CAD/CAM) system.

In addition, to enhance the usability of the product, Scan-Writer, Xyztek has developed a very high-speed multiprocessor computer, the Maxima 16.

Scan-Writer reportedly permits large-format engineering drawings, maps and photos to be directly entered into a computer system. This data may then be vectorized into various CAD/CAM formats for further processing and then replotted using the eight-color plotting capabilities of the system. Features include six minutes or less to scan an "E"-size drawing, 1,000 line/in.

Although Scan-Writer can be interfaced directly to a host computer, it may be advantageous to preprocess the data through Maxima 16 due to the high speed and large volume of data generated by Scan-Writer, the vendor said. Each Maxima 16 module is in itself a stand-alone computer offering eight user serial interfaces supporting up to 1M bit/sec transfer rates with a selection of multiple protocols. Implemented in parallel under the Xyztek's Xyznix operating system, 16 modules in tandem reportedly provide a high-speed and flexible computer.

Maxima 16 features are said to include 16 million instructions per second computer speed, 8M to 80M bytes of local memory, 128 users, virtual memory, user-selectable speeds and Quad Bus architecture to increase system bandwidth effectively.

The Scan-Writer is priced at less than $100,000. The price of the Maxima 16 ranges from $8,600 to $200,000, depending on configuration. Xyztek is located at Suite B-7, 8000 E. Prentice Ave., Englewood, Colo. 80111.

'Bill, Have You Lost Your Restart Capabilities?'

Dataserver Systems Simplify Winnie Integration Into Nets

SAN JOSE, Calif. — Priam Corp. has introduced two Dataserver microcomputer systems designed to simplify the integration of its Winchester disk drives into high-performance, multiuser computer networks.

Each Dataserver subsystem supports up to four Priam Winchester disk drives in any combination of formats — 5¼-, 8- or 14-in. disk sizes — with data rates up to 1.2 million bit/sec.

Two auxiliary ports permit the interface of the disk drives with other peripherals such as floppy disk and tape drives.

The Dataserver subsystem offers logical addressing, extensive formatting control, defect management, complete error recovery and concurrent processing.

The first version of the Dataserver, designated model DS101, is available immediately as a single-board subsystem and is priced at $875 in OEM quantities. The second version, dubbed the DS201, will be available before the end of the year and will include the Intelligent Peripheral Interface, the proposed Ansi standard for high-performance systems.

More information is available from the vendor at 20 W. Montague Expwy., San Jose, Calif. 95134.

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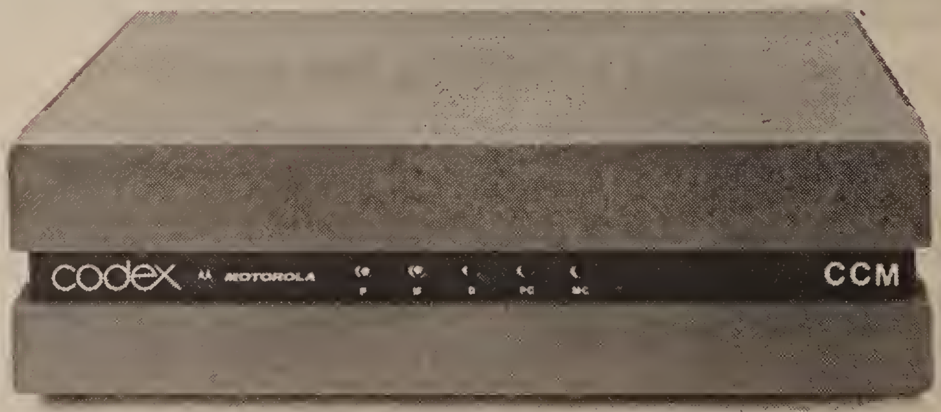

With Standard Software Execution

Firm Offers Four-User Multiprocessor Micro

HAYWARD, Calif. — Compupro Systems, Inc. has introduced a four-user multiprocessor microcomputer system said to feature concurrent execution of both 8- and 16-bit industry-standard software.

In addition, it announced that it has enhanced its unlimited licensing agreement with Digital Research, Inc. by adding concurrent CP/M 86 as an option to the Compupro System 816 microprocessor product line. The operating system will be called Concurrent CP/M 8-16.

The Compupro 10 is reported to be the first in a series of Compupro business computers that departs from the vendor's traditional IEEE 696 orientation. The new product is aimed at commercial organizations that have been using traditional minicomputer and microcomputer systems as well as personal computers in multiuser and networked environments.

Features include closely-coupled master/slave architecture; a dedicated central Intel Corp. 8088 processor with 768K bytes of main memory; seven serial ports, including a modem port; a Centronics Data Computer Corp. printer port; 384K bytes of solid-state disk memory; and dual 96-track/in., 5¼-in. floppy disks storing 2M bytes.

In a standard Compupro 10 configuration, each user terminal has access to its own 8-bit Zilog, Inc. Z80B processor, each with its own 64K byte random-access memory. The fully integrated package allows concurrent multitasking operation of both 8-bit and 16-bit programs under an enhanced version of Compupro's MP/M 8-16.

The Compupro 10 is priced at $4,995, excluding terminals, and is covered by the vendor's 12-month warranty.

Compupro is located at 3506 Breakwater Court, Hayward, Calif. 94545.

Utility Users Get Portables For Billing, Collecting Data

BIRMINGHAM, Ala. — Utility industry users may prepare bills and collect data in the field with two portable computers from Immediate Business Systems.

The PBM500 is a 10-lb unit with 256K bytes of nonvolatile bubble memory. It has a 40-char. electro-fluorescent display and a self-contained 140 line/min printer, which prints a customized bill in a user-designed format.

The PBM150 has 256K bytes of memory, a full alphanumeric keyboard, 80-char. liquid crystal display and weighs 3 lbs.

Both units operate under extremes of temperature and humidity, according to the company, and may be used in a turnkey fashion with a central computer. A total system with multiple PBM portable computers can range from $50,000 to $500,000 depending on the configuration. Immediate Business Systems can be reached through P.O. Box 2165, Birmingham, Ala. 35201.

IMP Micro Line To Meet Variety Of System Needs

SAN MARCOS, Calif. — Electro Design, Inc. has introduced its line of IMP personal computer systems designed for hobbyists as well as the business and scientific communities.

The IMP line is designed to allow users to purchase a system with hardware and software customized to fit their needs, a spokesman said. With a selection of CPUs, memories, drivers and special-purpose boards and peripherals, IMP systems can be configured to operate with many software packages to meet a variety of applications needs.

Three versions of the IMP system, which differ in their chassis capacity to accommodate boards and disk drives, are available: the six-slot IMP-6; the IMP-12, which contains 12-slots; and the IMP-18, with an 18-slot capacity. The IMP-12 provides mounting for two half-height floppy disk drives, while the IMP-18 can accommodate four such drives.

Optional add-on products include floppy or hard disk drives with capacities from .360M bytes to 30M bytes, black-and-white or high-resolution color monitors and high-speed and letter-quality printers.

The IMP personal computers range in price from $2,100 to $7,000, depending on the configuration chosen. Information can be obtained from the Director of Marketing, Electro Design, 960 Rancheros Drive, San Marcos, Calif. 92069.

3274 SYSTEM FROM ALONG.

IBM 3274 system users no longer have to pull individual cables each time they add or relocate terminals.

The Codex Cable Mux provides transparent, high speed communications for up to 32 terminals through one single cable. It saves you money and offers unlimited flexibility in setting up terminal clusters throughout your entire organization.

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Despite Micro Revolution, Minicomputers

(Continued from Page 95)

different instruction set, a different mini.

At any given time, there will be a limit to the power of a microprocessor. First, there are limits to how many elements can be squeezed onto one chip. The limits are increasing, but they will continue to exist. Second, there are limits to the speed of the elements. These limits work against each other; all else being equal, as you put more elements on a chip, the elements slow down.

As a result, the mini can be more powerful than the micro. A CPU built of several dozen chips can have more, and faster, circuits than the single-chip micro. However, micros will be more cost-effective where they suffice: Every element of a micro is designed for just one purpose, whereas the more general components in a mini cannot be exploited as fully. For one thing, the number of components on a chip may be limited by the number of pins the chip has. This number is on the order of several dozen. If chip designers try to escape this problem by connecting the components to each other within the chip, there is a good chance that the result will be only a partial fit to the need. With more and more circuit elements on a supposedly "general-purpose" chip, the likelihood is that a smaller and smaller fraction will be useful.

Region Grows

As technology evolves, the region in which micros are more cost-effective grows. The boundary separating them from minis moves up in cost and capacity. Five years ago, micros were limited to single-user systems. Today, many microcomputers support four to eight users entering data, running business applications or updating a shared data base. Multimicro lashups, such as Convergent Technologies' Megaframe, can support far more.

However, supermicro technology is not simple or cheap. A supermicro chip cannot be built in a garage. The investment in designers, design support tools and fabrication equipment amounts to many millions of dollars. No company takes such sums lightly. This limits supermicros to very high-volume products. If you just need a few, or a few hundred, developing a custom supermicro doesn't make economic sense.

Even though very large-scale integrated (VLSI) technology realizes its potential most fully in microprocessors, minis are not completely denied its benefits. Semiconductor firms have produced chips that are quite complex, but still useful in a wide range of minis. Four examples:

- The bit slice — This incorporates several bits' worth of arithmetic, logic and register storage. A popular bit slice, Advanced Micro Devices, Inc.'s (AMD) 2901, incorporates 16 registers plus arithmetic and logic functions — all 4 bits wide. To get a 16-bit mini, wire four together. Bit slices are intended to work that way: you get 16-bit carries, shifts and so on. Several other devices besides the AMD 2901 are available. Bit slices are economically viable because they can be used in many different mini designs. No single mini application would justify the chip's development cost, but as a group they all do.

The next step beyond the bit slice may well be the reduced instruction set computer (Risc). It is under development at the University of California at Berkeley, by David Patterson and his colleagues. A Risc is a microprocessor that executes a very simple instruction set at blinding speeds. It can be programmed to interpret other instruction sets, such as those of several existing minis. Used in this fashion, it is both a micro in its own right and a minicomputer implementation vehicle.

- The programmable logic array (PLA) — PLAs permit good fractional utilization of chips with very many gates. In addition to the gates themselves, a PLA includes a systematic interconnection scheme. A process akin to

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Still Seen as Viable Choice for 1983 Users

creating a read-only memory chip is used to create specific interconnection patterns. PLAs were factors in the cost-effectiveness of "superminis" such as Digital Equipment Corp.'s VAX-11/750 and Data General Corp.'s Eclipse MV/8000.

- I/O support circuits — Several integrated circuits have been developed to handle common peripheral devices and communications links. The Usart, for universal synchronous-asynchronous receiver-transmitter, is a good example of the latter. These chips reduce controller complexity much as bit slices reduce CPU complexity.
- The microprocessor — Even with Usarts and their relatives, controllers still need control. A simple micro can be a cost-effective alternative to many hard-wired logic circuits. Once in place, it can be programmed to take on more and more jobs.

This leaves us with this scenario: Micros are moving up. Where they can do the job, they are the technology of choice. Minis use large-scale integrated technology to retail good cost-effectiveness as complete systems. They are succeeding at a level above the fastest commonly available micros. Industry consultant Sandra Steere Bell said, "Supermicros will be the performers of choice for the corporate environment after 1984." She continued, "The corporate environment is beginning to appreciate nonproprietary operating systems and the ability of micro makers to react quickly to new technology. In addition, integrated software and efficient interconnect software — two major present gaps— are coming." Despite this, there are several reasons why a 1983 user might opt for the mini:

- The required performance level is above what micros can offer. Multimicro systems make sense for some applications, but not for all.
- The mini architecture is optimized for a specialized application. At any performance level, micros will steadily become more and more cost-effective than minis. Eventually, this technology edge will overcome the mini's potential advantage of specialization. The key word here is "eventually." For some applications, "eventually" could be many years away.
- Software compatibility is important. This can refer to a vendor's investment in systems software or to a user's investment in applications. The sum of these factors can perpetuate a technologically outdated product for years, to the genuine mutual satisfaction of both its vendor and its users.
- You can't tell them apart. If it looks like a mini, works like a mini and runs like a mini, who cares what's inside? Systems such as the DEC PDP-11/24, the Honeywell, Inc. DPS 6/40 and others use micros as the heart of their CPU. They are fully compatible with their minicomputer siblings — in software, packaging, I/O busing and every other way.

Cost-Effective Results

In this article, we have defined them as micros. To the user, definitions don't matter — results do. These systems offer cost-effective results. In this regard, minis are defending themselves against the micro onslaught by assimilating the invader. Eventually, micros will be accepted as simply the right way to design most computers. Then we can stop worrying about the definitions and get on with the job.

Some mini vendors have real concerns about the future. They see the micro trend imposing a few "standard" architectures on everyone. If that's the case, what will happen to their beloved 19-bit instruction set? And how about all that software written for it?

The answer is simple. Many proprietary low-end instruction sets will go the way of the dinosaur, just as ¾-in. magnetic tape and round holes in punched cards once did. Univac didn't lose its identity when it switched to 80-col. cards with rectangular holes. System vendors don't have to

(Continued on Page 102)

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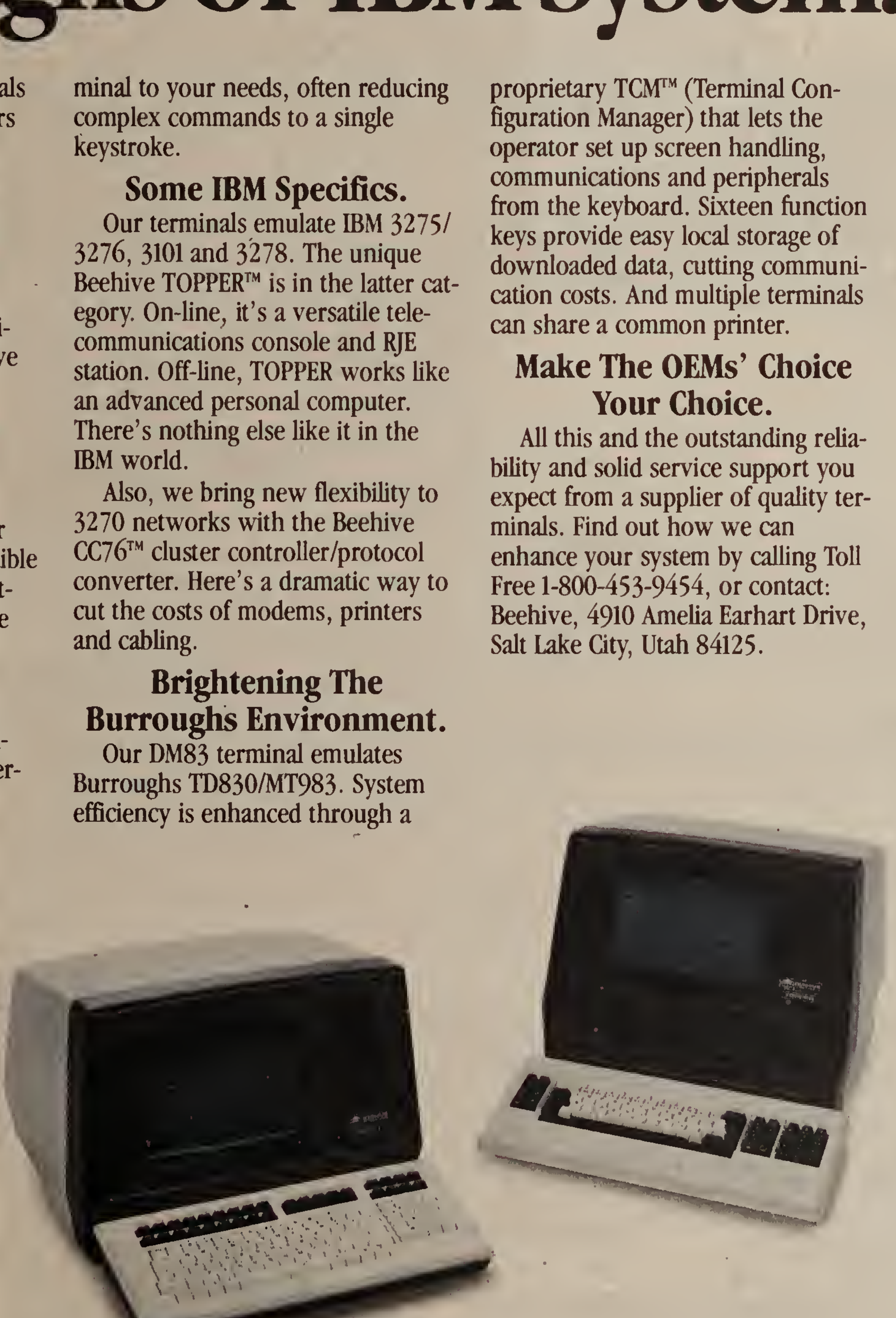

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Incorporated Into DEC Units

DEC to Service Non-DEC Products

MAYNARD, Mass. — Digital Equipment Corp. has announced that for the first time, the company will service selected non-DEC products incorporated into DEC computer systems. The equipment to be supported includes printers, disks, tapes, controllers and communications interfaces.

Among the non-DEC products the company will service are selected Printronix, Inc. and Data Products printers, Control Data Corp. and DSD disks, Kennedy Co. tape drives, Emulex Corp. and Westpercorp controllers and Able Computer, Inc. communications equipment. Responding to customer demands, the company intends to expand its service plans for this type of equipment in DEC-based systems during the next 12 months, a spokesman said.

A DEC spokesman stressed that DEC is not endorsing the purchase of competitive products nor is it acting as the service agent of vendors that sell those products. For noncompeting equipment, however, DEC may become a service agent, subject to agreements.

When acting as a service agent for other manufacturers, DEC commits to provide installation, warranty and maintenance services for the vendor's hardware sold onto DEC systems.

The first of DEC's service representative agreements for another manufacturer's noncompeting equipment is with Ampex Corp.'s Memory Products Division for mainframe memory.

DEC is located at 146 Main St., Maynard, Mass. 01754.

Mini Forecast To Survive Rise of Micro

(Continued from Page 101)

lose their identities when they adopt a standard micro. IBM didn't lose its identity when it chose the Intel Corp. 8088 microprocessor for its Personal Computer. The way in which the whole system is put together will still distinguish one vendor from another.

A few vendors, those with very high-volume products and semiconductor development resources, will put their proprietary instruction sets on micros. IBM, DEC, DG, Honeywell, Hewlett-Packard Co. and perhaps others have such micros today. Does this give them an edge over smaller firms using generally available chips? Not necessarily. It does let them use existing software for a few more years. It also ties up funds that could be used to develop networking software or intelligent graphics workstations.

Meanwhile, though, users don't have to worry. Technological improvements can only benefit them. The real issue is how well the job gets done and at what cost. Users who concentrate on that question will find that the technology will take care of itself.

Mallach is general manager, Northeast Division, of General Systems Group, a software and systems consulting firm. In addition, Mallach is associate professor of computer science at Worcester Polytechnic Institute and contributing editor, System Architecture.

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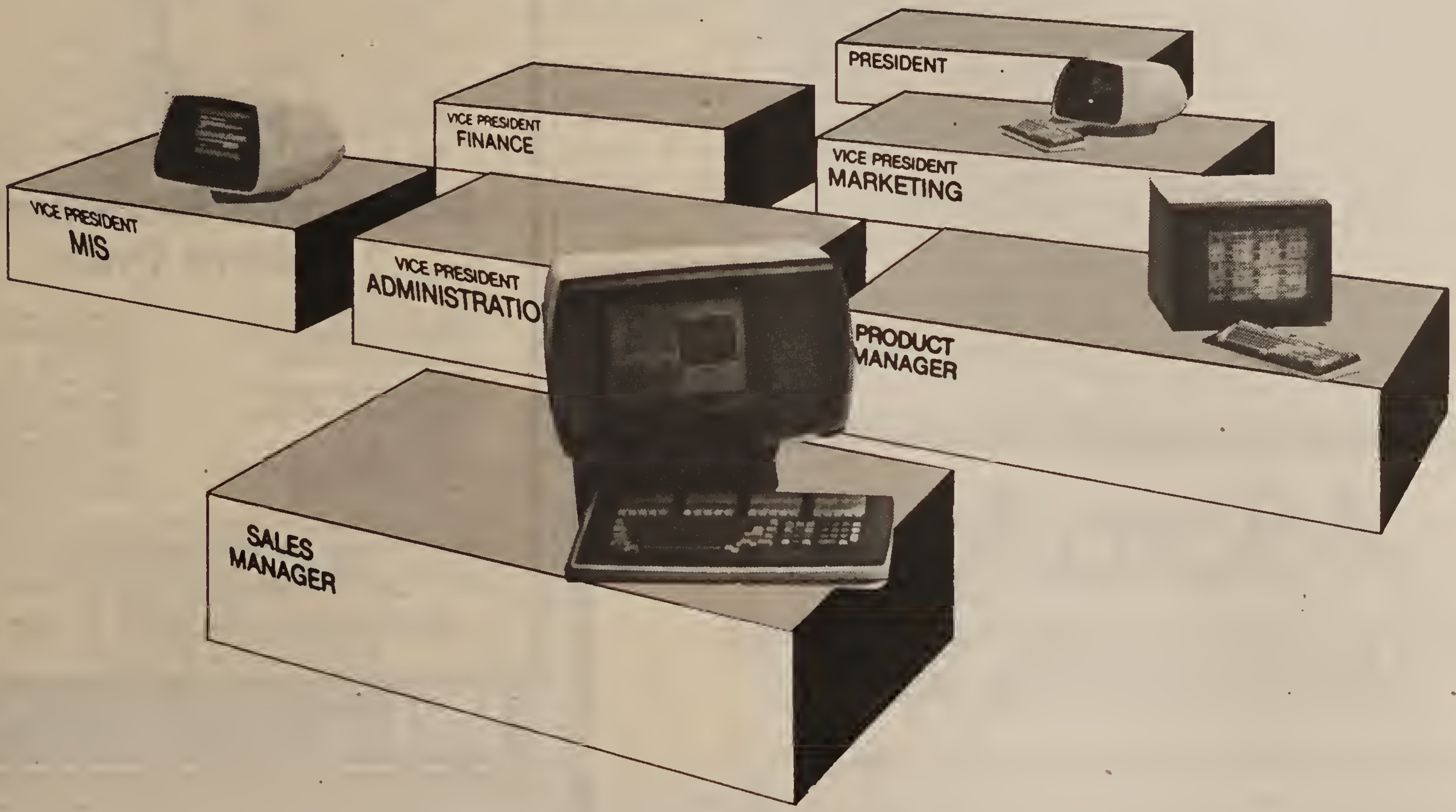

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DLB Unveils EW-300 Economist's Workstation

WELLESLEY, Mass. — DLB Computer Systems, Inc. has announced the EW-300 Economist's Workstation, a hardware-software system which combines a 32-bit mini, a disk storage subsystem, a data base management package, a data analysis and graphics package and a one-year subscription to an economic and financial time-series data bank.

At the same time, DLB introduced Packrat, the data base management package included with the EW-300.

The EW-300 Workstation is based on Apollo Computer, Inc.'s DN-300, a graphics-oriented desktop computer with 1M byte of main memory. The workstation also includes 34M bytes of on-line Winchester disk storage and access to Apollo Computer's 12M bit/sec Domain local-area network. Through the network, an EW-300 can become part of a shared resource environment, DLB Computer said.

Packrat, the interactive time-series data base management system included with the EW-300, is also available for use on the Apollo Computer Domain series microcomputer. The Packrat package can be used to create a data base of 5M to 20M bytes, load time-series data, modify or update data and retrieve information previously stored.

The Packrat system can operate on a variety of data series including corporate financial statistics, securities market price and volume data, production statistics and government indices.

The EW-300 workstation also includes the Easymodeler interactive statistical analysis and graphics package, which allows the user to access information stored in a Packrat data base, as well as to transform, analyze and graph such data.

Also included in the EW-300 system is a one-year subscription to a subset of Citibank's Citibase data bank of U.S. economic and financial data.

The complete EW-300 workstation is priced at $38,500. The Packrat data base package alone costs $3,500 per Apollo Domain node. Further information is available from DLB Computer Systems at Suite 309, One Hollis St., Wellesley, Mass. 02181.

Decision Data Will Service Select TI Systems, Peripherals

HORSHAM, Pa. — Decision Data Computer Corp. has announced that its Customer Service Division will provide nationwide on-site field service and depot repair of Texas Instruments, Inc.'s 990/10, 990/12 and DS990 computer systems and peripherals.

In addition, Decision Data will offer maintenance on a full range of compatible peripherals, including disk drives and controllers, printers and display units.

The acquisition last year of the hardware maintenance business of International Micor Systems has enabled Decision Data to combine its maintenance capabilities and resources with Micor's TI experience.

Decision Data's Customer Service Division is located at 400 Horsham Road, Horsham, Pa. 19044.

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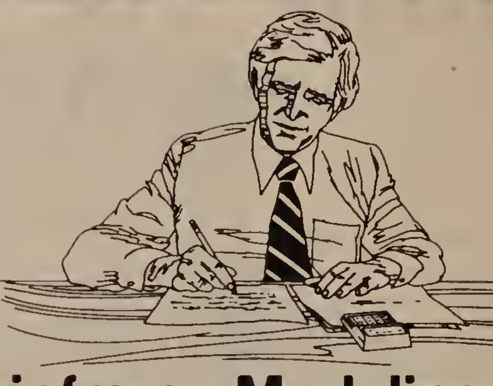

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IBM-Compatible Micro Boasts Local Net

SAN JOSE, Calif. — An IBM Personal Computer-compatible personal computer with a built-in local-area network will be introduced at Comdex in Las Vegas, by Santa Clara Systems, Inc. and will sell for approximately $1,300, it was announced recently.

The PCterminal functions as an intelligent terminal on the Personal Computer network, PCnet, which already has been announced by Santa Clara Systems. PCnet users can add PCterminals instead of Personal Computers to increase the number of user stations, a vendor spokesman said.

An optional floppy disk drive allows users to run programs locally as well as over the network. Also included with the system is a monitor, a keyboard, an Intel Corp. 8088 microprocessor, serial and parallel interfaces, four expansion slots for peripheral cards, 256K bytes of random-access memory and a connection for an optional 5¼-in. floppy disk drive.

Santa Clara's PCterminal

"We're playing up the networking terminal aspect of it, but it can be used as a stand-alone IBM-compatible computer with the addition of a disk drive," a Santa Clara Systems spokesman said.

The PCterminal is said to run programs under the IBM DOS operating system and the Santa Clara Systems version of Microsoft, Inc.'s MS-DOS — SCS-DOS. A proprietary network protocol is said to allow the PCterminal to initialize its operating system from the remote floppy disk of a Personal Computer or hard disk.

Using this network protocol, the system can communicate in the network without its own floppy disk drive. The system picks one Personal Computer in the network and shares its peripheral devices. Up to 16 PCterminals can be connected to one Personal Computer or Personal Computer XT on the network.

PCnet has a transmission rate of 1M bit/sec and allows machines to be linked with several thousand others through an adapter board and software. PCnet is built into PCterminal, according to a vendor spokesman.

The PCterminal also features "remote execution," which allows a user on one terminal to run a command on another terminal or Personal Computer as if the command had been entered on the second computer's keyboard. With this feature, one computer can act as an execution server for other computers or terminals in the network.

First customer shipments of the system will be in the second quarter of 1984. The price will be $1,295 for the PCterminal with the built-in networking. PCnet is available separately for $695, a vendor spokesman said.

More information is available from Santa Clara Systems, which is located at 1860 Hartog Drive, San Jose, Calif. 95131.

Processor Serves as Net Device, Data Communications Terminal

ATLANTA — Lanier Business Products, Inc. has introduced a professional computer said to serve as a network device and data communications terminal as well as a stand-alone unit.

The Lanier Business Processor 1000 can reportedly be linked with other individual workstations in the Lanier Business System 5000 network. In addition, the computer is said to communicate with existing office systems using an IBM 3270 Systems Network Architecture 3780 communications capability.

Lanier 1000 users may use Lanier's One-Step word processing package, which includes EZ-Task, EZ-Spell, Greek Scientific, Lanier Business Basic, data manager, graphics and networking, according to a spokesman for the vendor.

In addition to the computer's own software, Digital Research, Inc.'s CP/M and Microsoft, Inc.'s MS-DOS operating systems are supported by the computer. Software options include Peachtree Software, Inc.'s Peachcalc electronic spreadsheet and Peachtext word processing package.

The Lanier 1000 is priced at $2,995, the spokesman said, from Lanier, which is located at 1700 Chantilly Drive N.E., Atlanta, Ga. 30324.

Interface Fits IBM, TI Micros, Compatible With Xerox Net

SANTA CLARA, Calif. — Ungermann-Bass, Inc. has introduced a network interface unit (NIU) for IBM and Texas Instruments, Inc. personal computers said to be compatible with Xerox Corp.'s Ethernet local-area network.

Based on the vendor's Net/One local-area network systems, the Net/One Personal Connection is said to allow personal computer users to share information and integrate it with IBM hosts via IBM's Systems Network Architecture (SNA).

Personal computers configured with the unit can reportedly run any applications programs under Microsoft, Inc.'s MS-DOS operating system without modification. The Net/One Personal Connection also features SNA gateways allowing the personal computers to emulate IBM 3274 controllers or 3278 terminals and 3287 printers.

Priced at $850, the Personal NIU includes MS-DOS networking commands. The vendor's Printshare and Diskshare software on 5¼-in. diskettes is priced at $500 per server from 2560 Mission College Blvd., Santa Clara, Calif. 95050.

Firm Announces IBM Interface

WALTHAM, Mass. — An interface to connect IBM Personal Computers and Personal Computer XTs to the Proteon Associates, Inc. Pronet local-area network was recently announced by Proteon.

Pronet is a 10M bit/sec token-passing ring for use in networks up to several kilometers in length with up to 255 nodes. The IBM Personal Computer and Personal Computer XT interface will allow users to transfer files, under Microsoft, Inc.'s MS-DOS operating system, within networks of IBM Personal Computers and to and from mainframe computers.

The interface costs $595 from Proteon, 24 Crescent St., Waltham, Mass. 02154.

Exxon Arm Adds To Facsimile Line

STAMFORD, Conn. — Exxon Office Systems Co., a division of Exxon Corp., has added to its line of facsimile products a digital transceiver that can reportedly communicate with other units at a rate of 40 sec/page.

The Exxon 2210 Qwip unit is said to be compatible with most 3 min/page facsimile machines and reportedly serves as a satellite to the company's "hub" product, the 2310 Qwip. The new unit is also reportedly compatible with the 2310 machine, while offering similar transmission quality, according to an Exxon spokesman.

The unit costs about $3,000 from 777 Long Ridge Road, Stamford, Conn. 06902.

Extension Gives IBM Micro Users Transferring Capabilities to CPUs

KING OF PRUSSIA, Pa. — Integrated Technologies, Inc. has announced an extension of its Soft-Switch system to permit users of the IBM Personal Computer to transfer word processing documents to an IBM or compatible mainframe for archiving, translating and forwarding to other word processors.

Using Softword Systems, Inc. Multimate word processing program, documents can reportedly be transferred to other word processors by inserting the appropriate location codes when the Soft-Switch menu requests them. According to a vendor spokesman, Soft-Switch transmits the document without need for intervention by either receiving or sending operators.

Soft-Switch is priced at $20,000, and Multimate costs $5,000, according to the spokesman. More information is available from Integrated Technologies, which is located at 200 N. Warner Road, King of Prussia, Pa. 19406.

Directory to Provide Listings for Fax Users

NEW YORK — A cooperative effort among major facsimile manufacturers is bringing together a facsimile users' directory, which will list the corporations' facsimile machine locations and telephone numbers, it was announced by Greenfield Information Services.

In addition to machine locations and phone numbers, the directory will list compatibility information, hours in use, backup phone numbers and individual contact names.

The companies cooperating in the preparation of the list include NEC America; Canon; Panafax; Pitney Bowes, Inc.; Sharp; 3M Corp.; and Xerox Corp. The first edition of the directory will be published in early 1984 and will appear annually thereafter, according to a spokesman for the group.

The price of the directory will be $40. More information is available from Greenfield Information Services, 551 Fifth Ave., New York, N.Y. 10176.

Panafax Announces Option For MV-3000 Fax Machine

WOODBURY, N.Y. — Panafax Corp. has announced the availability of an option for its MV-3000 facsimile machine that is said to allow the unit to utilize packet-switched networks, providing communications with various types of electronic office equipment.

The option, called the X.25 packet-switched network option, reportedly eliminates errors in copy received from faulty telephone lines and provides users with the ability to translate and transmit hard-copy information from a facsimile format into a digital format used by computers.

The X.25 option costs $2,200; the MV-3000 machine costs $6,250 from Panafax, 185 Froehlich Farm Blvd., Woodbury, N.Y. 11797.

Northern Telecom Adds Capability To OA Systems

NASHVILLE, Tenn. — Northern Telecom, Inc. has announced a personal computing capability package for its Models 585, 565 and 445 office information systems.

The Northern Telecom personal computing option is compatible with all integrated data processing, word processing and communications capabilities of the system.

Users can add the personal computing option to Northern Telecom's multiterminal systems, eliminating the need for additional stand-alone personal computers.

The price of the option package is $1,495.

More information is available from Northern Telecom, 259 Cumberland Bend, Nashville, Tenn. 37228.

E-Mail System Operates With IBM Host

GREENVILLE, S.C. — Steel Heddle, Inc. has introduced an electronic mail system said to operate with any IBM host computer operating with IBM's CICS operating environment, IBM's Basic Mapping system software and IBM's Vsam filing method.

The Wizard Mail system reportedly features optional automatic hard-copy printout of each message, confidential message recognition, message priority assignments, display status of mail sent, stored message file and message security via password.

Menu-driven Wizard Mail can be used on all terminals with access to the host computer system and requires no special training or installation, the vendor said. Priced at $495, Wizard Mail is available through Steel Heddle, P.O. Box 1867, Greenville, S.C. 29602.

Loma to Sponsor Meet Oct. 17-19

NEW ORLEANS — Life Office Management Association's (Loma) Operations and Systems Division will sponsor its fifth administrative services conference here Oct. 17-19.

Designed for life company managers responsible for their companies' word processing, micrographics, records management, printing and reproduction and office systems, the conference will feature two general sessions and several workshops.

At the opening session, Robert Kalthoff, president of Access Corp., will discuss the use of application and document-based optical mass memory systems.

Registration for the conference costs $135 for Loma members and $200 for nonmembers. More information is available from Loma at 100 Colony Sq., Atlanta, Ga. 30361.

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Top U.S. Firms Take High Road To Scotland With Micro Plants

By Tom Henkel
CW Staff

EDINBURGH — At least three major U.S. systems manufacturers have established, or are currently establishing, microcomputer manufacturing facilities in Scotland in efforts to meet the growing demands of users in Europe and the UK.

IBM, which has used its Greenock, Scotland base as a manufacturing and warehousing center since the early 1950s, has opened a second 96,000-sq-ft manufacturing facility to produce both Personal Computer and Personal Computer XT processors.

In addition, this April IBM opened what it claims is one of the most fully automated materials distribution centers in the world. The center, which is largely controlled by Series/1 minicomputers, is being used to store and distribute parts and materials to IBM facilities throughout the UK and Europe, noted Alex Wilson, plant director.

While IBM declined to say how many microcomputers the Greenock plant is capable of producing, observers estimated the plant is capable of manufacturing between 30,000 and 50,000 micros per quarter.

Digital Equipment Corp. plans to use its 300,000-sq-ft manufacturing facility in Ayr, Scotland, as an assembly plant for the firm's line of microcomputers. Gerry Smith, manufacturing operations manager, explained that less than 5% of the Ayr

(Continued on Page 110)

SEMICONDUCTOR FORECAST SUMMARY 1983–1986

(Shipments in Millions of Dollars)

	1982	82–83 Change	1983	83–84 Change	1984	84–85 Change	1985	85–86 Change	1986
TOTAL SOLID STATE									
U.S.A. Total	5605.6	+17%	6558	+25%	8212	+22%	10,011	+21%	12,068
O.E.M.	4433.5	+14%	5062	+26%	6375	+22%	7770	+21%	9383
Distributor	1172.1	+28%	1496	+23%	1837	+22%	2241	+20%	2685
Western Europe	2797.2	+ 7%	2995	+18%	3530	+19%	4191	+15%	4832
Japan	408.2	+13%	460	+17%	539	+15%	618	+13%	700
Other International	564.0	+44%	814	+35%	1096	+25%	1371	+22%	1670
WORLDWIDE TOTAL	9374.9	+15.5%	10,827	+24%	13,377	+21%	16,191	+19%	19,270
PRODUCT SUMMARY									
TOTAL ICs	6898.9	+18%	8134	+28%	10,418	+25%	13,004	+22%	15,871
TOTAL DISCRETE	2476.0	+ 9%	2693	+10%	2959	+ 8%	3187	+ 7%	3399

QUARTERLY COMPARISONS

	1st Qtr/Change*	2nd Qtr/Change*	3rd Qtr/Change*	4th Qtr/Change*	Total/Change**
1982	2259 -3%	2439 + 8%	2328 -5%	2349 + 1%	9375 + 1.1%
1983	2324 -1%	2627 +13%	2803 +7%	3073 +10%	10,827 +15.5%
1984	3170 +3%	3392 + 7%	3360 -1%	3455 + 3%	13,377 +24 %

* % change from previous quarter

** % change from previous year

Source: SIA

SIA Sees Semi Shipments Doubling in Value by 1986

By Robert Batt
CW West Coast Bureau

SANTA CLARA, Calif. — Total shipment values of semiconductor components in 1986 will be almost double those of 1982, with a projected growth to $126 billion within 10 years, according to figures released by the Semiconductor Industry Association (SIA).

At its Seventh Annual SIA Forecast Dinner held here recently, the association predicted that 1983 shipments by U.S. and Euorpean semiconductor manufacturers will reach approximately $10.8 billion, a 15.5% increase over last year, when the industry experienced the most severe recession in its history.

Growth rates for 1984 through 1986, the SIA added, are expected to be even greater — a 24% growth in 1984 to $13.4 billion, followed by a 21% jump in 1985 and a 19% jump in 1986 to reach $19.3 billion. The statistics were prepared for the SIA by the Semiconductor Trade Statistics Program.

Presenting the forecast at the annual dinner, Jerry Sanders, chief executive of Advanced Micro Devices, Inc., said boom times are again in store for the semiconductor industry. "After a two-year lull in which the industry has been characterized by price cutting, we are now beginning a new high growth period," he told his audience.

According to the SIA forecast, the most dynamic growth rates will be in integrated circuits, which represented nearly 74% of total solid-state sales in 1982. Shipments of integrated circuits are expected to increase 18% this year for a total value of $8.1 billion. Subsequent yearly increases, the forecast added, are expected to be between 22% and 28% with integrated circuits representing more than 80% of total solid-state sales by 1986.

As for discrete devices, the forecast predicted sales of $2.7 billion in 1983, a 9% increase compared with a year ago.

In his speech, Sanders cited specific areas of the industry that are expected to witness especially high growth rates over the next few years. Digital Cmos, he said, is expected to increase 33% in shipment

(Continued on Page 108)

CCI Betting on Office of Future For Success of Next Venture

By Bill Laberis
CW Staff

ROCHESTER, N.Y. — Can a company that has earned its fortune providing the telephone industry with computerized directory assistance systems make a dent in the hotly competitive office automation market?

The management at Computer Consoles, Inc. (CCI) is betting it can. And CCI is backing its bet with a belief that the office of the future will demand a full measure of fault-tolerant systems operating in a Unix-like environment.

Last month, the company announced the formation of its Office Systems Group, headquartered in Reston, Va., and led by 37-year-old former Intel Corp. executive John E. McNulty. Although the group will account for only about 10% of CCI's $70 million-plus revenues this year, company officials are confident that sales of office products will outstrip those from the telephone side within four years — while the telephone business continues to grow 25% per year.

"Of course the markets are very different," said Vaemond Crane, CCI president and chief operating officer, comparing the captive telephone market and the more competitive office automation arena. "But we'll be building off the technological experience we've gained with the phone companies. It's the applications that matter in the market."

To accomplish its heady office automation ambitions, CCI has endowed Office

(Continued on Page 112)

John McNulty

AMD Tops Record in Second Quarter

SUNNYVALE, Calif. — Earnings, revenues and new orders all topped previous records at Advanced Micro Devices, Inc. (AMD) in the second quarter, as the company reported earnings of $12 million or 21 cents per share on sales of $128 million.

The earnings tripled the earnings of the same period a year ago and represented a 50% increase over first-quarter earnings. Sales were up 49% over the $86 million mark posted the same period a year ago.

New orders in the period soared to $208 million, reflecting the renewed vitality within the semiconductor industry. Bookings at AMD more than doubled the pace set a year ago, the company reported.

W.J. Sanders III, president and chief executive officer, said, "The record new order activity, which remains at boom proportions, continued unabated through the traditionally slow summer months. Though initially led by personal computer manufacturers' need for microprocessors and related peripheral circuits, the recovery is now spreading to include our more traditional customers in the professional computation and communication universe in all geographic sectors of the market."

Zenith Data Inks Pact to Provide U.S. Air Force, Navy With Micros

GLENVIEW, Ill. — Zenith Data Systems Corp. has received a contract from the U.S. Air Force and Navy for delivery of up to 6,000 desktop microcomputers and associated peripherals and software over the next three years. The contract has an estimated value of more than $29 million.

Under the terms of the contract, Zenith will supply its Z-100 microcomputers, which will be integrated with other Department of Defense computer systems. The company will supply its dual 16- and 8-bit Z-100s, 60% of which will be equipped with Winchester disk drives, Zenith said.

The Z-100 family of microcomputers was designed for financial management and other administrative applications and has been available commercially for a year.

Computer Consoles Group To Develop OA Products

ROCHESTER, N.Y. — Computer Consoles, Inc. has established an office systems group to develop integrated hardware and software products for the office market, the company announced recently.

The new division will be based in Reston, Va., and will build on the company's telphone systems technology to develop integrated information systems incorporating word and data processing, file management, electronic mail and administrative and decision support functions, according to a spokesman for the company.

Products from the division will have a number of features, the company spokesman said, including integrated software, the Unix operating system and fault-tolerant capabilities.

Semi Mart Predicted To Boom

(Continued from Page 107)

value during 1983, for total sales of $810 million, with subsequent yearly increases of between 40% and 43% through 1986.

Dramatic growth, he added, will also be seen in digital bipolar products with sales of transistor-to-transistor logic-Schotty logic large-scale integration (LSI) circuits expected to total $506 million in 1983, a 53% increase over 1982; sales growth for this product line, he said, is expected to increase between 34% and 50% per year through 1986.

"The demand for microprocessors and peripherals combining LSI/VLSI bipolar, MOS and Cmos technologies is the area of greatest potential for growth and represents a major shift in the marketplace. It is the domestic industry's area of greatest strength. We lead international competitors, and we must continue to make substantial research and development investments in order to retain our technological edge in the future," he asserted.

The SIA forecast said growth of semiconductor sales in the U.S. will continue to outpace that of Europe and Japan. However, Sanders voiced some frustration at the difficulties of competing in the Japanese marketplace. "Although industry shipments for Japanese consumption are forecast to grow at a modest rate year to year, we are by no means satisfied with our level of market penetration. While we have kept the doors open to Japanese manufacturers in good times and bad, Japan has closed its doors to us except in boom times," he complained.

Sanders said that while the Japanese market is estimated to grow from $4.5 billion to $8 billion over the next three years, the U.S. share of that market is expected to continue falling.

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Japanese Seen Dominating Some DP Sectors by 1987

NEW YORK — Japanese manufacturers will dominate some sectors of the U.S. information processing market by 1987, according to a recent report from Frost & Sullivan, Inc.

The report, "Japanese Penetration into the U.S. Communications, Data Processing and Office Equipment Markets," says the U.S. information processing market is under Japanese "attack" as relentless as the camera, automobile and stereo industries have already experienced. Fujitsu Ltd., Nippon Electric Co. and Hitachi Ltd. have captured nearly half the U.S. market for advanced memory chips not by dumping, but by providing high quality, the report stated.

The report forecasts enormous gains in market share by Japanese exporters in the following segments:

- Among CPUs, micros will feel the brunt of Japanese strength, as that nation's share of the U.S. market jumps from 1% in 1983 to 30% in 1987.
- Japan will capture 45% of the floppy disk drive market and 35% of dot matrix printers by 1987.
- In office products, Japanese manufacturers will increase their domination of the copier market from 80% to 95% and up their facsimile machine share from 54% to 85% in the 1983-87 forecast period.
- Heaviest communications market impact will be felt in the private branch exchange area, where Japan's share of the U.S. market will jump from 15% to 32%.
- Even software will feel the sting, as Japanese systems software captures 23% of the market by 1987, up from less than 0.5% today.

Detailed penetration forecasts are developed through in-depth analyses of the U.S. competitive climate today for mainframes, minis and micros, word processing systems, communications equipment and semiconductors, alongside corporate profiles of 11 leading Japanese companies and their joint ventures.

The study is available for $1,250 from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

USPS Gives EDS Net Contract

DALLAS — Electronic Data Systems Corp. (EDS) has been awarded a seven-year contract by the U.S. Postal Service (USPS) calling for an automated solution using a network of minicomputers and microcomputers to support functions associated with airborne mail. The contract is worth an estimated $200 million.

The cornerstone of the project is a process control system that will coordinate the tasks of dispatch, planning, weighing and coding of mail pieces and assignment to airline carriers, the company said.

The USPS moves an estimated 1.6 billion pounds of mail by air annually, and the imminent phasing out of the Civil Aeronautics Board places total responsibility on the USPS.

The first year of the contract is valued at $39 million, after which a six-year agreement for optional hardware and maintenance could increase the contract to the $200 million figure.

Commenting on the contract award, Gary J. Fernandes, EDS corporate vice-president, said, "Recognizing that productivity improvements have led to increased competition from the private sector, the Postal Service has massive plans to automate its services. Our task will be to help accomplish this goal by providing the system engineering, the equipment and the expertise to bring these elements together quickly and economically."

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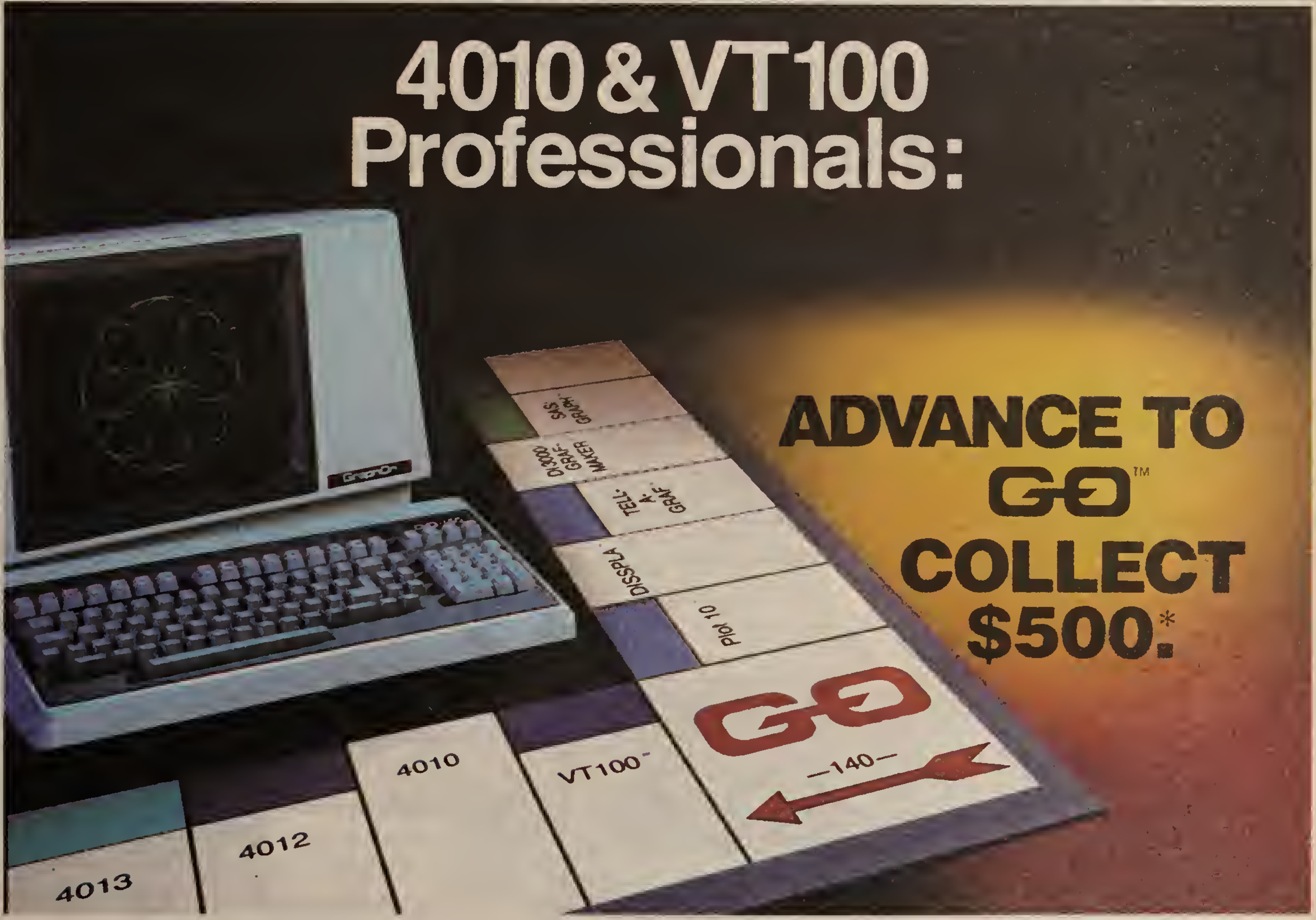

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Telecommunication Services

NCR, ICI Start Venture

DAYTON, Ohio — NCR Telecommunications Services, a subsidiary of NCR Corp., has entered into a joint venture with Interstate Communications, Inc. (ICI) of West Point, Ga., to market long-distance telephone, data transmission and other telecommunication services to businesses in major metropolitan cities in the U.S.

The new venture, Heritage Communications Corp., will build on the respective products of both companies in offering a range of competitively priced telecommunication services, NCR said. Heritage will offer ICI's Touch & Save long-distance service, which utilizes NCR's nationwide switching network.

The service is initially being marketed in the San Francisco area and will be expanded to New York in early 1984.

According to NCR Telecommunications President G. James Bracknell, Heritage "brings to the business telecommunication services market the expertise of a major computer manufacturer and a regulated telephone carrier . . . to offer cost-effective . . . telecommunications services to a broad range of business customers."

Firms Take High Road To Scotland

(Continued from Page 107)

facility is currently being used for microcomputer assembly, with the rest of the plant being used as a final test and assembly facility for customized minicomputer systems.

Smith explained the Ayr facility is now being retooled for use as a microcomputer manufacturing facility. The first microcomputer to be produced at the site will be the low-end PC100, or Rainbow microcomputer. The plant will also produce the larger PC350 and the Decmate word processing system, Smith said.

DEC plans to begin its first shipments of microcomputers in the spring of 1984, Smith explained, so many of the 540 employees at the Ayr plant will be retrained to perform manufacturing, as opposed to testing functions. Wang Laboratories, Inc. is currently building an 85,000-sq-ft manufacturing facility on the campus of Scotland's Stirling University. Scheduled for completion by next May, the facility is being built mainly for assembly of the firm's Professional Computer, according to John Dolan, general manager of Wang Laboratories in Scotland. He said Wang manufactures larger systems at a similar assembly plant in Ireland.

Dolan said the Scotland facility will give Wang an advantage over Japanese manufacturers in supplying micros to the UK and Europe, because the Sterling plant also makes use of local suppliers.

All three projects are being aided with funding by the Scottish Development Agency, a government bureau aimed at attracting business ventures to Scotland. The agency offers financial incentives, such as grants, tax breaks and equity loans to established and start-up firms.

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U.S. Semiconductor Success Linked to Broad Consensus

By Robert Batt

CW West Coast Bureau

SANTA CLARA, Calif. — The future success of the U.S. semiconductor industry will depend on the willingness of manufacturers to work together, according to Robert Noyce, vice-chairman of Intel Corp.

Speaking at the Seventh Annual Semiconductor Industry Association (SIA) Forecast Dinner here recently, Noyce said the common denominator for successful industry efforts in the past has been consensus.

"Our future success will depend on broadening this consensus and forging new constructive programs based on broader industry coalitions," he told his audience of 750 industry executives.

Characterizing this approach as "the coming of age for semiconductors," Noyce outlined a number of strategies and priorities to be followed over the next few years.

"We consider it imperative that the U.S. semiconductor industry gain true access to the large and rapidly growing Japanese market. Repeated efforts over the past 20 years have been frustrated, and the industry's approximate 10% market share hardly demonstrates the relative competitiveness of the two industries," he stated.

Noyce warned that if U.S. companies continue to be frustrated in their marketing efforts in Japan, the SIA will consider seeking legal remedies. "In our view, more is at stake here than the interests of the U.S. and Japan. If the U.S. can achieve an open and equitable bilateral trading environment, then this success model will be communicated to Europe and the Third World and, in due course, be emulated," he said.

Noyce also cautioned against "hard-liners" in the U.S. who want to place greater restraints on the export of sensitive high technology out of fear that it will get into Soviet hands.

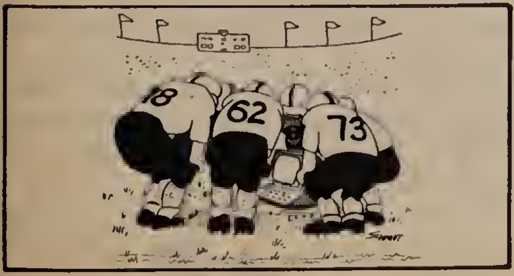
The SIA case, he argued, is embodied in the concept of a comprehensive operations license for multinational corporate technology transfers "based on corporate self-discipline rather than bureaucratic licensing controls."

On the contentious issue of the research and development tax credit, Noyce asserted it must be extended, made permanent and liberalized.

Of particular importance, he said, is increased tax credit for company contributions to university research, since, he claimed, a strengthened research partnership between industry and universities is essential.

"Antitrust exemption for joint research and development is necessary for the semiconductor industry to continue to expand its basic research activities and maintain world-class competitiveness. Individual firms cannot support extensive basic research because the 'capture ratio' of costs to benefits is uneconomic. Joint research expands the capture ratio," he contended.

Noyce said increased protection must also be afforded to intellectual property. No company, he maintained, will be willing to invest $50 million in new microelectronic research if predatory copies can duplicate the microcode and other critical design parameters and market the product at a fraction of the innovator's price. The SIA solution, he said, is to pass legislation that defines unauthorized copying as illegal under U.S. copyright laws.



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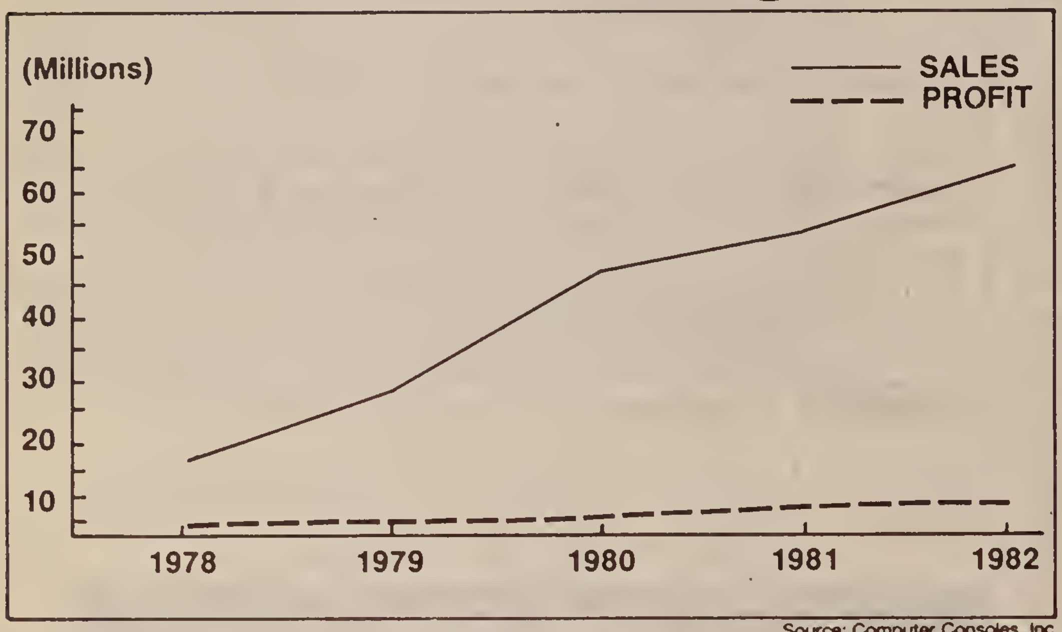
CCI Execs Betting on Making Dent in OA Mart



Source: Computer Consoles, Inc.

CCI's Five-Year Sales and Profit

(Continued from Page 107)

Systems with its dedicated sales force. Third-party distributors will handle the bulk of international sales, but the domestic sales force will provide the primary market thrust.

The sales force will initially target specific vertical market segments, such as the legal market, which CCI has already penetrated. The federal government is another prime target, which company officials believe will be among the first areas to embrace fully office automation as a means of cutting its labor-intensive overhead.

On the technology side, CCI is committed to its Unix-like operating software and fault-tolerant hardware base, powered by the Motorola, Inc. 68000 microprocessor. The Unix capabilities will allow CCI's users to pick and choose from the wealth of applications software written for Unix systems.

Office Systems' first product, Officepower, is aimed at the heart of the office automation market, integrating word processing, electronic mail, file management, telephone messaging and spreadsheets. Systems Network Architecture capabilities will also be provided so as not to exlude CCI from the formidable installed base of IBM.

In 1982, CCI spent a whopping 22% of revenues on research and development. Both the sales effort and CCI's product development will be bolstered by an $80 million stock issue planned for the end of the year.

But for all its ambitions and its healthy balance sheet (profit of $7.4 million on $63 million in sales in 1982), CCI remains in the minds of many familiar with it as another of the phone industry's captive suppliers. As company president Crane put it, "We need a lot more corporate visibility because we have a corporate image problem . . . Our strategy is to be niche-oriented — you can't be everything to everybody unless you're IBM."

The chore of changing this image problem will fall largely on the shoulders of McNulty, vice-president and general manager of Office Systems. McNulty emphasized that CCI is not moving away from its traditional strengths in making its office thrust, but merely applying a proven and transferrable skill to another, potentially more lucrative market.

Fault-tolerant capabilities will become a chief selling point for CCI's systems in the office market, McNulty said, as the number of computer users in the paperless office of the future grows. Declining costs of hardware will make it possible for users to purchase fault-tolerance capabilities at a 10% to 15% premium, he predicted.

CCI is spending "big bucks" in getting Office Systems up and running, McNulty said. "We really have all the flexibility of a start-up. We know this end of the business is not going to be easy."

Study: OA Units Not Being Mixed

NEW YORK — The number of vendors in office automation (OA) may change drastically over the coming decade, but the big names of today will remain the big names of tomorrow, according to a new study by Frost & Sullivan, Inc.

The report, "The Office Automation Market in the U.S.," indicates that customers are staying with their vendors' products rather than integrating different systems and software.

The report forecasts that by 1992, annual OA purchases will increase to $37.6 billion from $6.8 billion in 1982 (in constant dollars).

The study is available for $1,275 from 106 Fulton St., New York, N.Y. 10038.

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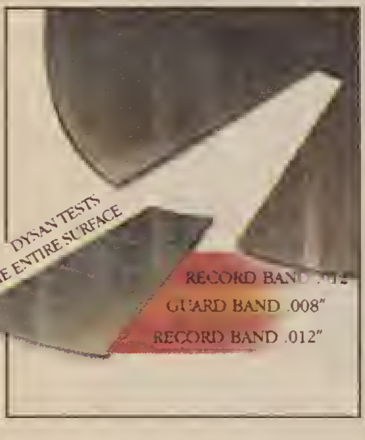

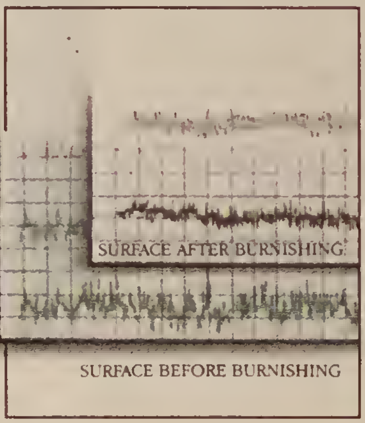

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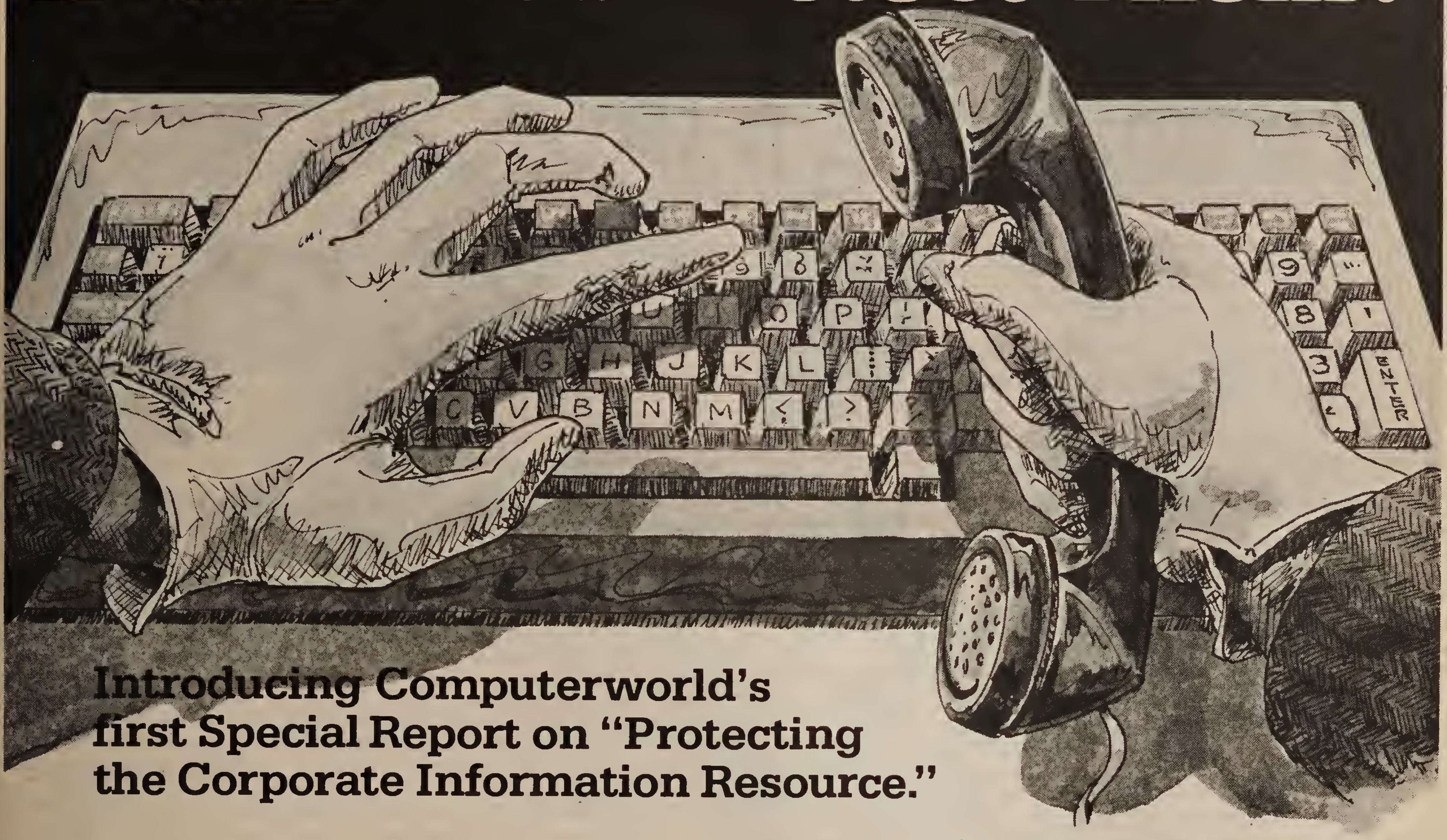

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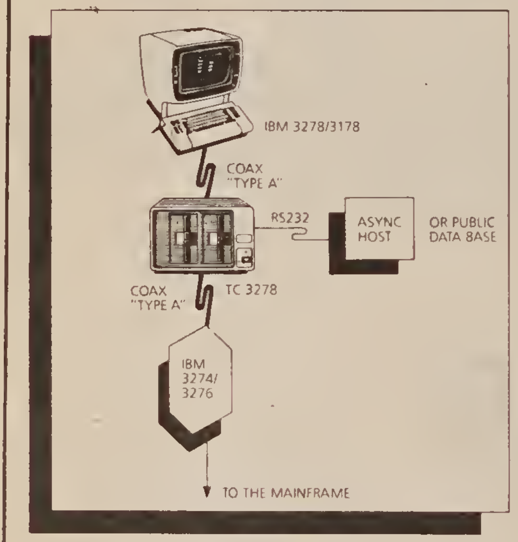

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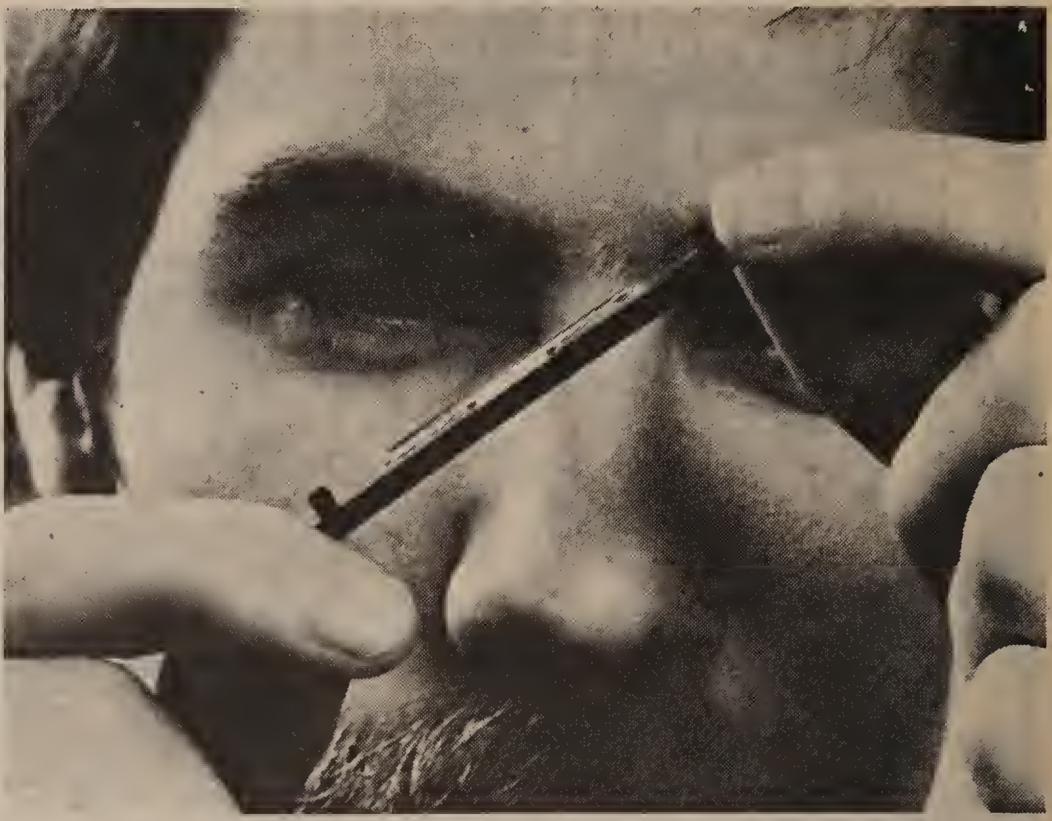

Up close and personal, a technician checks the splicing of an optical fiber made by GTE Corp.'s elastomeric splicing system. The system, said by GTE to be faster and cheaper than any other fusion technique, will be shown at the upcoming Telecom '83 show in Geneva.

Exec: IBM Software Strategy To Change Significantly

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — IBM's software strategy is based on a gradual evolution that will add up to significant changes over the next 10 years, a software company executive said here recently.

Speaking at a conference to discuss IBM's future directions, Martin Sprinzen, vice-president of technical services at Candle Corp., said Big Blue's long-established MVS/370 architecture is dying a slow death and will be replaced by the new MVS/XA.

"Clearly MVS/XA is IBM's strategic operating system of the future, but by slowly evolving it, the MVS we will see in 10 years' time may be a lot different from the MVS of today," he told his audience of data processing professionals.

Need to Know Requirements

One of the problems with software development, he asserted, is that to forecast trends there accurately, pundits need to know what software users will require in five years' time. "The future is dependent to a large degree on human psychology."

However, he ventured, it is clear that IBM is moving toward running MVS more at the high end of its product range, while leaving low-end computing in the domain of VM.

Included among the problems Sprinzen cited for the demise of MVS/370 and the rise of MVS/XA were: virtual storage limitations, concerns by both IBM and users about the reliability of the 370 product, the greater number of devices that can be attached using MVS/XA and IBM's apprehension about the growing popularity of fault-tolerant computing systems from competitors such as Tandem Computers, Inc.

Conversion problems to the new architecture, he predicted, will be minimal. Further, XA will contribute greatly to the reduction of I/O bottlenecks, he said. "For example, using XA, each I/O function on the IBM 3380 will take 30% less time."

New releases of XA, he predicted, will be announced in quick succession by IBM and will feature full access method support and further virtual storage constraint relief.

"With the advent of MVS/XA, IBM is creating standard interfaces between various components. This will allow a user to change totally one side of a standard interface without changing the other side. In fact, by the end of the decade we may well see systems where operators are redundant except in dealing with critical breakdowns," he remarked.

This is not to say that MVS/XA will be without problems for users, Sprinzen stressed. The "human maintenance problem," he predicted, will get worse as more applications are added on-line. He warned that the security and integrity of data will also be of major concern, and there will be a greater use of encryption devices.

MVS/XA will also face competition, particularly from Japanese fifth-generation systems competing with some of the artificial intelligence functions that may run under MVS, Sprinzen predicted.

Future of VM

Turning to the future of VM, Sprinzen contended that VM/XA will not be a strategic software direction for IBM, although he predicted there will be VM/XA products to utilize more fully dynamic channel subsystems, 31-bit addressing facilities and quad processing.

He also suggested that IBM will keep VM more up to date with MVS in the future, with a MVS/VM interface, additional microcode assists and improved Systems Network Architecture support.

IMS, he added, will be taken in the direction of a totally integrated approach to distributed data bases, with the emphasis remaining on the high-end market and including 24-hour-a-day operations, quick restart facilities, production data bases and large networks using Vtam with up to 25,000 terminals.

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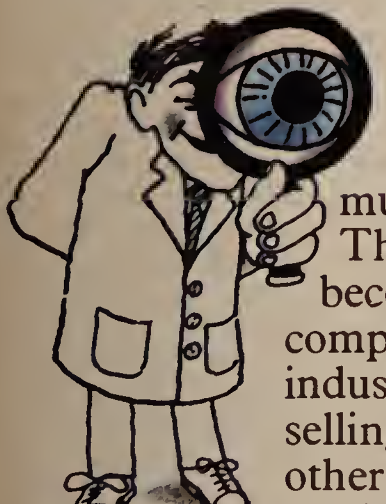

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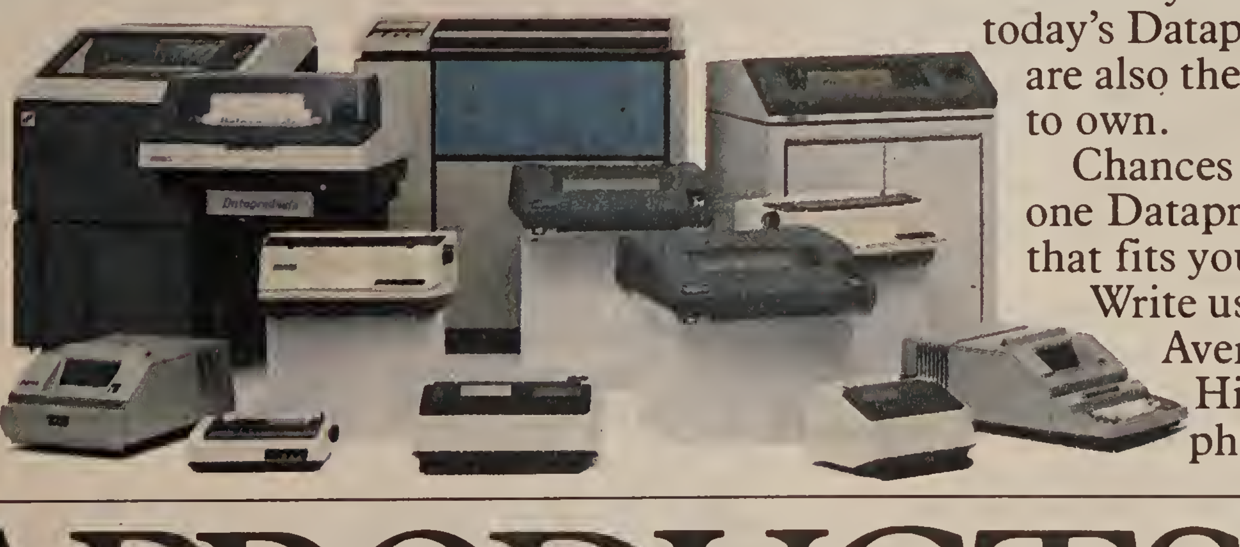

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Purchase Decisions

Reliability of a machine, the available features or functions and ease of use are the primary influences on a purchase decision, according to "Office Automation Survey: Analysis of Acquisition and Use of Office and Communications Equipment" by Venture Development Corp. (VDC). Price is only a secondary factor when a company is selecting this equipment, the report found.

VDC cautioned manufacturers against the use of a "price pitch" to move advanced office products, even though such a tactic has strong short-term appeal. Few companies take the high road and emphasize product benefits, according to one VDC analyst, who added that far too many sell strictly on "price, price, price." One reason cited for an emphasis on price is the very real price declines said to have characterized electronics products. However, VDC suggested that rather than trying to generate enthusiasm simply because of these price declines, manufacturers should emphasize greater product value.

The report costs $1,850 from VDC, which is located at One Washington St., Wellesley, Mass. 02181.

Electronics on the Rise

Based on the numbers — a $13 billion domestic market still growing at nearly 12% a year — U.S. producers of electronic components may be tempted to envision a tide of unlimited potential sweeping them well into the 1990s, according to "U.S. Semiconductor & Other Electronic Components Markets" by Predicasts, Inc. Supporting this belief, the report predicted electronics will remain one of the world's fastest growing industries for at least another decade.

However, the firm cautioned, navigating the tide will become increasingly difficult. Increased foreign competition, tightening price pressures and ever-changing product requirements were cited as the chief

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Forecasts & Findings

reasons why producers will have to stay on their toes to remain competitive. Licensing agreements with foreign producers and technology sharing among U.S. companies reportedly are two ways domestic firms are preparing for the market share battle. Also, the government will be pressured to help U.S. producers remain competitive. But relatively free trade will result in a $10 billion trade deficit by 1995.

The study is priced at $1,400. Predicasts is located at 11001 Cedar Ave., Cleveland, Ohio 44106.

Processor Mart Hot

Communications and network processors have evolved to represent the most dynamic and lucrative segment of the explosive U.S. data communications industry. By 1986, this rapidly expanding market will top $1.5 billion, reflecting a compound annual growth rate of 21.2%, according to "Network Processors and Gateways" by Creative Strategies International, Inc. (CSI).

Although message-switching systems and network controllers represent the highest growth — and most sophisticated — segments of the market for communications processors, according to the report, the market's strength stems primarily from large-volume front-end and remote concentrator sales. However, the network controller and statistical multiplexers will compete with remote concentrators over the next several years, retarding the growth of that segment, the study said. In addition, CSI indicated that product distinctions are rapidly blurring as heightened competitive pressures lead to increased communications processor power and versatility, thus overlapping functions.

The report is available for $1,450 from CSI, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

IBM Tough on PCMs

IBM is getting tougher on European competitors who try to ride into the marketplace on its coattails with plug-compatible manufacturers' (PCM) equipment, according to "The IBM Market in Europe" by Frost & Sullivan, Inc. As such, the best hope for such suppliers lies in establishing a market niche in which they will be seen as providing more complete products than the market leader, the report said.

Behind this trend are shortened product life cycles and more aggressive marketing by IBM, Frost & Sullivan reported. Another spur is said to be increasing competition from Japan and the newly liberated AT&T Information Systems, Inc. operation, all of which is inspiring "intense activity in terms of product development, entry to new markets, more flexible pricing policies and a cooperative attitude toward secondary suppliers."

At stake is a market for DP hardware products worth nearly $6 billion in 1982 shipments, whose annual values are expected to pass $16 billion by 1987. Further, the report predicted that over $63 billion in equipment will be shipped over the 1983-87 period.

The study is priced at $1,600 from Frost & Sullivan, located at 106 Fulton St., New York, N.Y. 10038.

Pitney Bows Out Of WP Market

STAMFORD, Conn. — Three years after it entered the word processing market with the acquisition of Artec International, Pitney Bowes, Inc. has announced plans to discontinue its line of WP equipment due to operating losses suffered.

Canceling the line will result in a reduction of third-quarter earnings by more than $22 million or 57 cents per share, the company said.

Commenting on the decision, George B. Harvey, company president and chairman, said, "We can see a more profitable future . . . by increasing investments in our core businesses where we have strengths that give us major opportunities for excellent and sustained growth with improved profitability."

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Austria Looking for U.S. High-Tech Investment

By David Myers
CW New York Bureau

NEW YORK — The coalition government of Austrian Chancellor Fred Sinowatz has begun to fish for high-tech American companies to invest in the land of Mozart, Strauss and Freud.

Finance Minister Herbert Sacher, in New York recently for the opening session of the United Nations, met with reporters at the Metropolitan Club here and asked them to deliver his plea to U.S. companies in search of European manufacturing sites.

"Not manufacturing in the sense of assembly, but rather in the sense of research and development requiring a high degree of engineering and know-how," Sacher clarified. Austria boasts 70 technical colleges graduating 3,000 engineers a year, he said.

Austria thus joins Ireland and Scotland, two nations that got a jump on the rest of Europe, in campaigning for U.S. manufacturing investment in the Old World.

Sinowatz's government is dangling subsidized loans at 5% to 6% interest covering up to half the cost of a company's investment in Austria, as well as cash grants of up to $7,000 per job created plus tax deductions, according to Robert F. Karl, managing director of the Austrian Industrial Cooperation and Development Co.

The Austrian computer market is still small, Karl admitted — 1,200 mainframes and between 5,000 and 6,000 small to medium-size computers, with 85% of the equipment coming from the U.S. But that market is growing at a rate of 25% a year, he added.

"Austria is behind," Sacher allowed. "But we expect to catch up rapidly over the next few years."

Austrian citizens at the press gathering told *Computerworld* that while automatic teller machines are popping up throughout the country, most offices in Austria have yet to be automated.

No computers are at present being manufactured in Austria, though there is some semiconductor fabrication and passive component-making in the country, Karl said.

Sacher sang the praises of his nation's economy, saying "price stability is the motto of Austrian economic policy" and "the time lost in strikes can be counted in minutes."

But under questioning by reporters, Sacher acknowledged the Viennese government's policies restrict the flow of data between computers in Austria and computers in any other European nation.

"It's not protectionist. It's considered a protection of the individual against the misuse of data. However, the rules in Austria on data flow are so strict that even the government suffers. I am anxious to change this," Sacher said through a translator.

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Micros Seen As Opportunity To Dispel Myth

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — Managers of information services should use the opportunity presented by the growth of personal computers to dispel the notion that data processing is sacred turf.

This was the message delivered to a group of DP professionals here recently at the Third Annual Conference on Personal Business Computers sponsored by the National Institute for Management Research.

Speaking at the conference on the subject of "MIS and DP Department Opportunities in the Personal Business Computer World," Mimi Will, professor of business and information processing at Foothill College, Los Altos Hills, Calif., said DPers have the choice of regarding personal computers as a problem or as an opportunity.

"One opportunity for MIS is to dissolve the notion that data processing is sacred turf and that there are 'haves' and 'have nots' regarding information," she asserted.

DP departments, Will added, must be far more willing to have individual interactions with end users.

"DP managers are in a position to manage change far more readily than end users because they have control over the corporate data base. If they give up these rights and privileges they will have lost the game to the [personal business computer] users.

"At the same time," she added, "DP professionals need to take many more risks than they have and follow their intuitive sense of what needs to happen rather than simply rely on a computer printout to make decisions. To do this will require feedback from end users, which means being willing to work with them on an individual basis," she stressed.

End users, she remarked, want fast solutions to problems; to implement effective responses, DPers must surround themselves with a strong base of people with different disciplines.

"The people problems relating to personal computers are the most critical ones to solve. MIS managers need policies which have widespread support among users, otherwise users will sabotage the systems in place and try to get around the ground rules," she warned.

POSITION ANNOUNCEMENTS

Database Applications Programmer

Staff position for the development and support of database applications in the Office of the Dean of the Wharton School. Duties include design and implementation of new applications systems, maintenance and enhancement of existing systems, and consultation with users.

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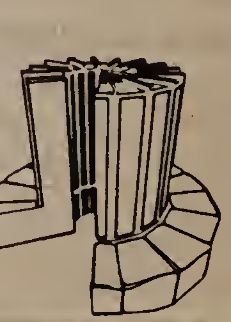

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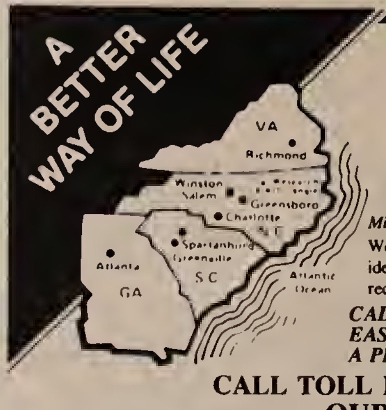

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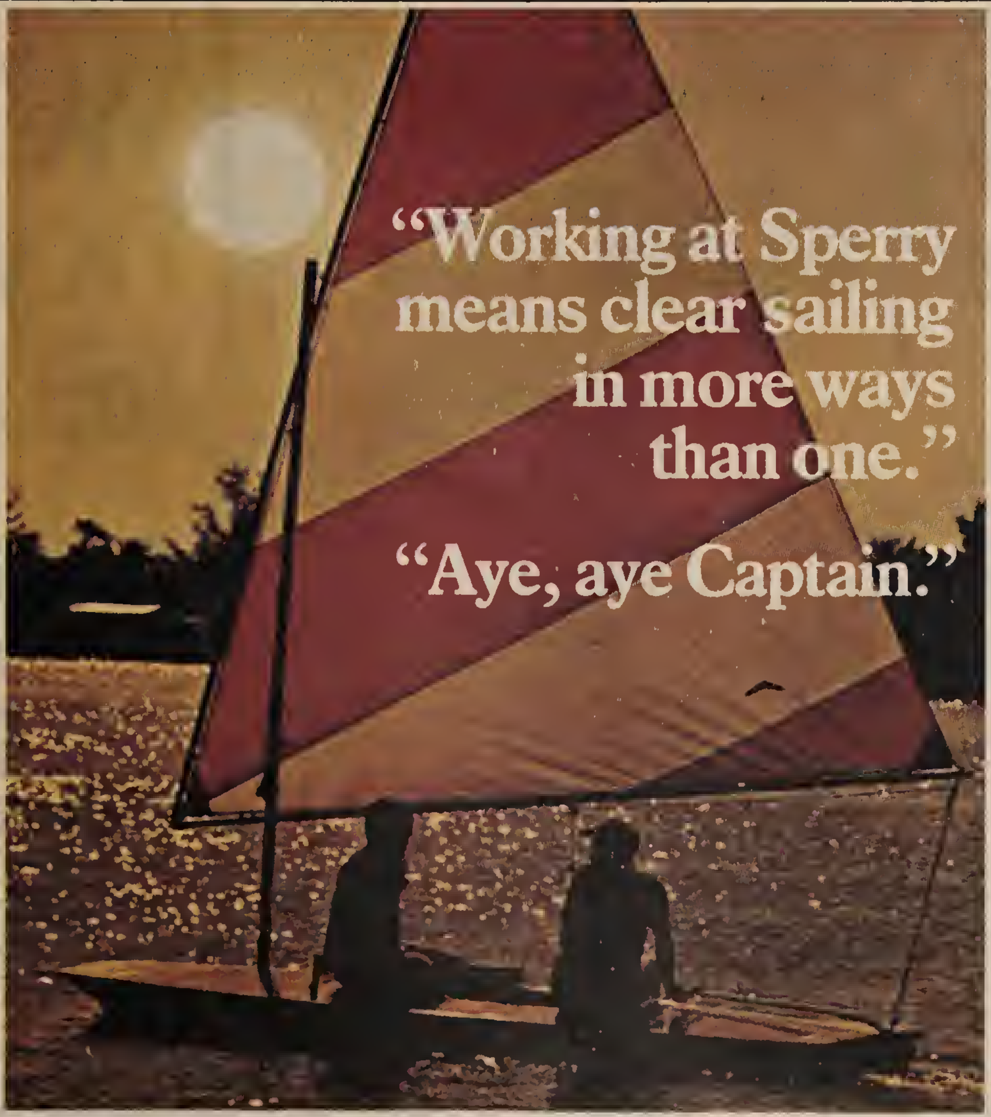
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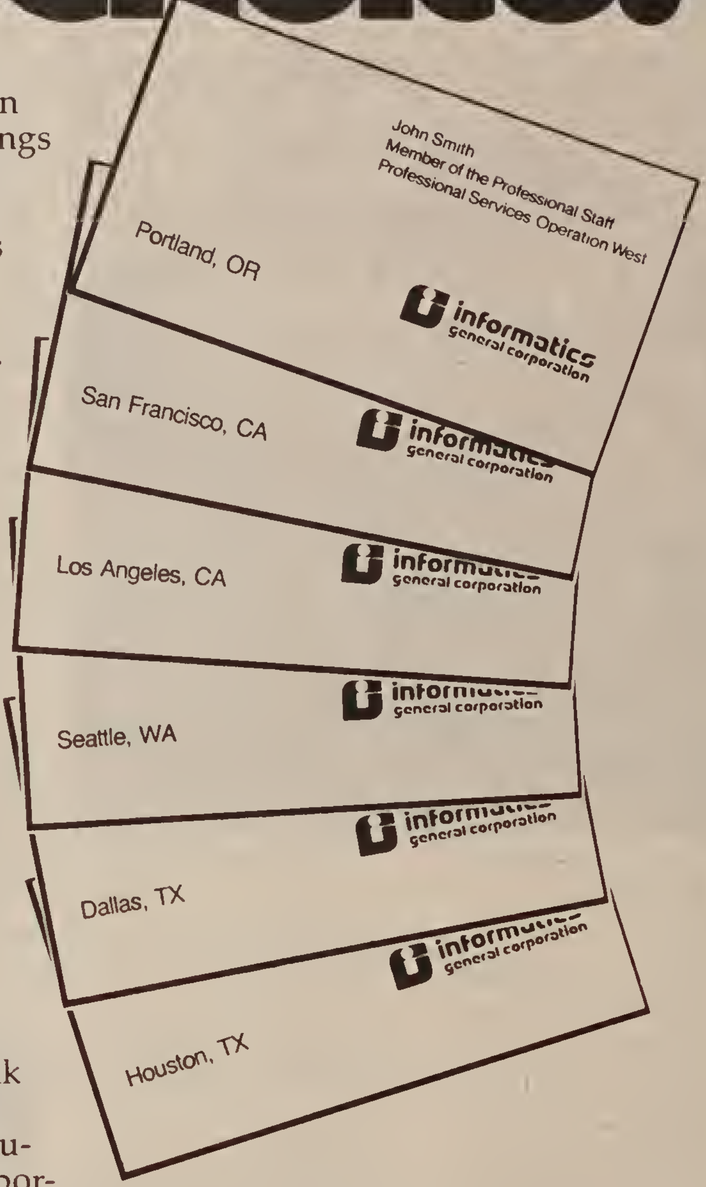
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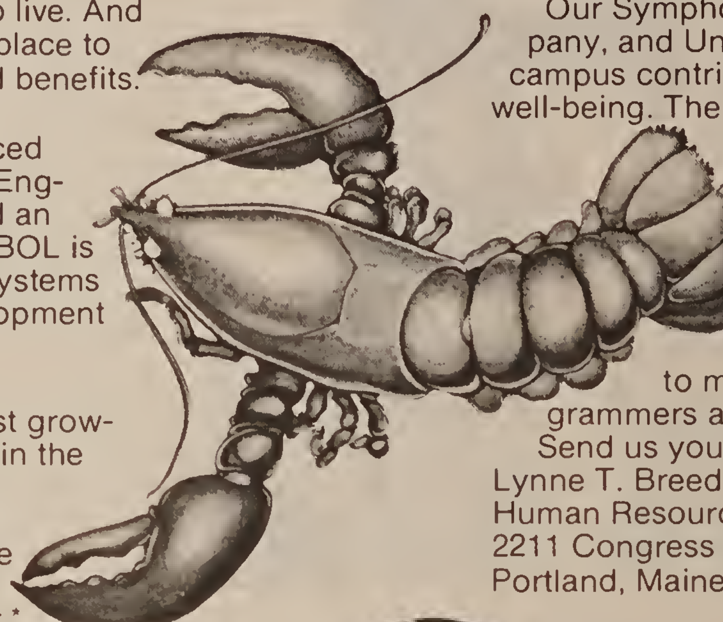

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International firm providing full service information systems consulting has an opening in Salt Lake City for an experienced information systems professional. Position requires a mix of technical, managerial, and marketing skills. The ideal candidate would have large systems experience, business systems planning experience, knowledge of state-of-the-art office automation requirements, and strong project management skills. Advanced degree and experience in proposal preparation would be a definite plus. Submit resume and salary history to M. Berrett of Arthur Young, 50 South Main, Suite 1400, Salt Lake City, UT, 84144 or call (801) 359-7711.

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Michael Reese Hospital and Medical Center, a leading Chicago health care and research institution is currently seeking a seasoned professional to provide systems programming and database support for our large-scale online Hospital Information System. This high-visibility position will provide technical and planning support for our TECHNICON medical information system.

The qualified candidate will have experience in the generation and maintenance of the DOSVSE operating system as well as hands-on experience with the TECHNICON system. In addition, familiarity with 4300 series hardware, DOSVSE utilities, and performance tuning is required. VM experience is a definite plus.

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Send confidential resumes by October 31, 1983, to:

Dr. John M. Tyler
System Network Computer Center

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Systems Programmer—Requires BS in Computer Science or Engineering with minimum 2 years experience on DEC VAX equipment. Duties include performing system manager functions on multiple DEC VAX systems by providing technical support on VMS and other DEC software products.

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We offer competitive starting salaries and a comprehensive benefits package. For confidential consideration, send resume with salary history to C. S. Martens, Black & Veatch, Engineers-Architects, P.O. Box 8405, Dept. CW1010, Kansas City, Missouri 64114.

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Openings in Tulsa.

ACP/TPF Systems Programmers

Position requires three or more years experience in ACP/TPF operating systems internals and indepth knowledge of assembler language, VM/CMS required. Responsibilities involve development of state of the art ACP/TPF enhancements, Applications Development tools, and Data Base Support utilities. Provides support to a multiprocessor, ACP environment.

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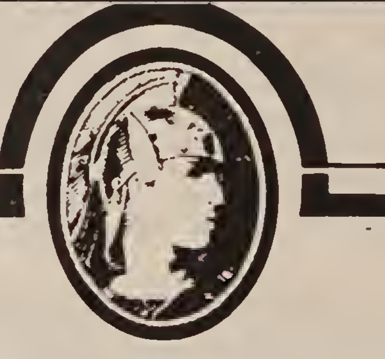

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CADD
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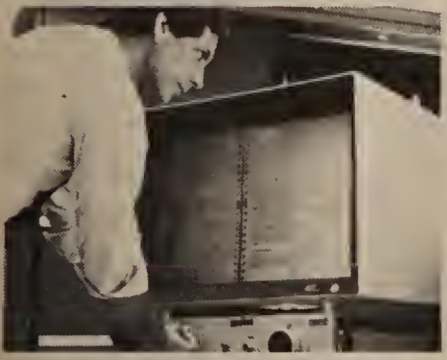

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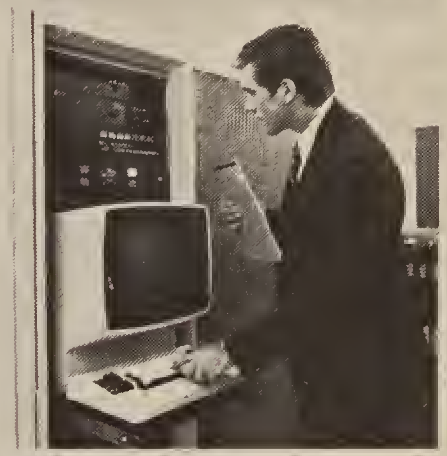

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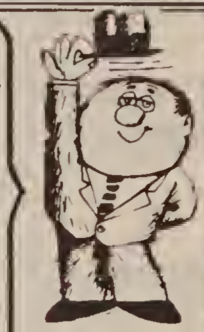

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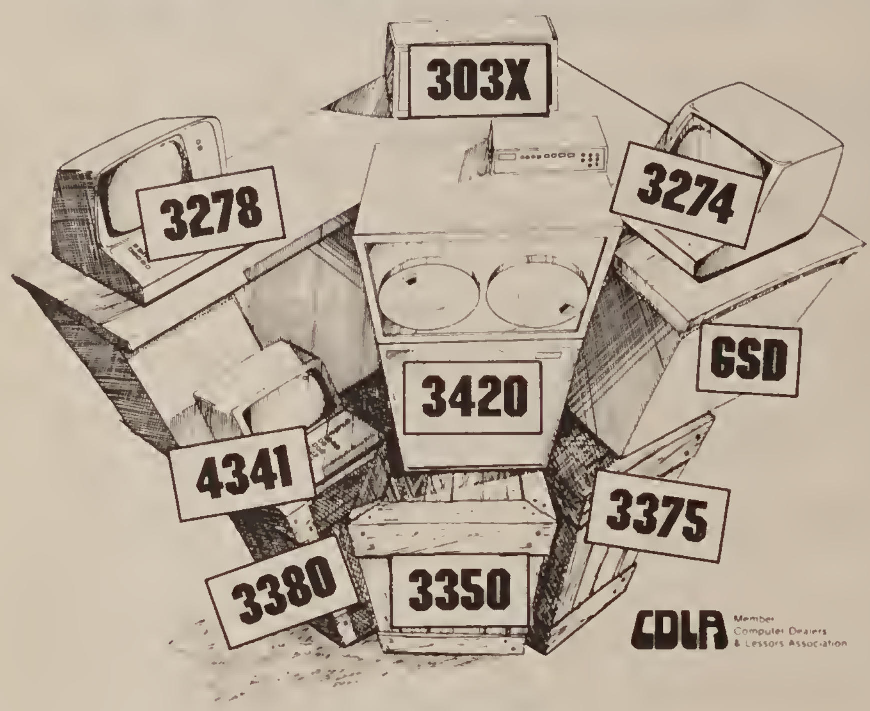
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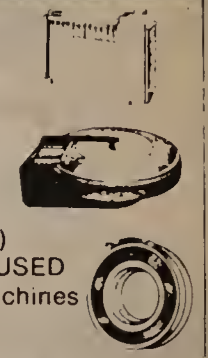

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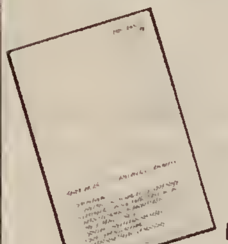

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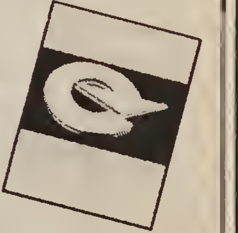

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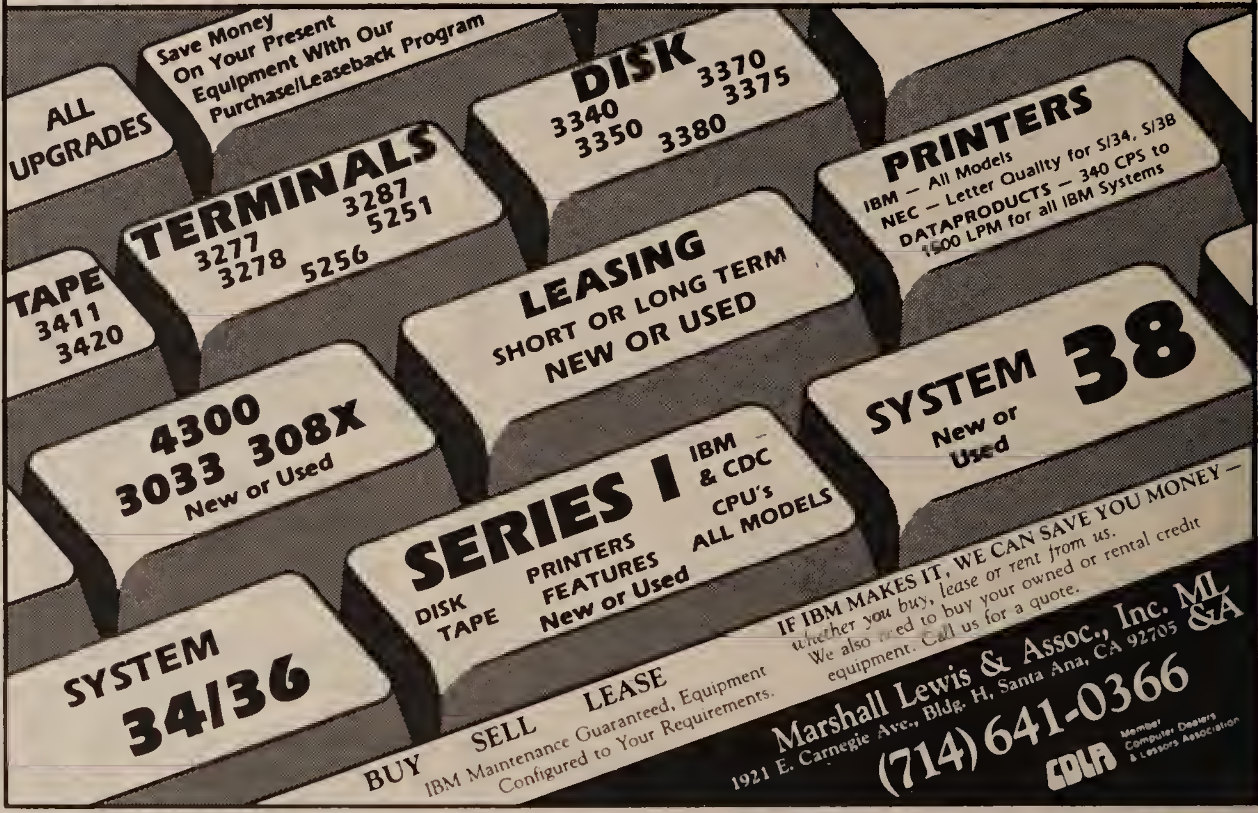
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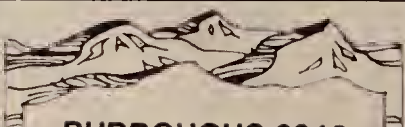

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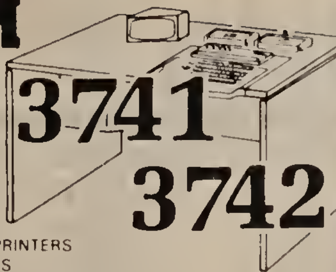

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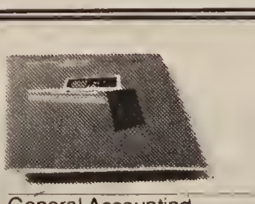

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CLOSING PRICES WEDNESDAY, OCTOBER 12, 1983

All statistics compiled, computed and formatted by
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EXCH		PRICE 1982-83 RANGE (1)	CLOSE OCT 12 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	12- 24	13 1/2	- 1/2	-3.5
O	ALTOS COMPUTER SYST	9- 28	8 1/2	-1 1/4	-12.8
A	AMDAHL CORP	9- 30	19	+ 1/2	+2.7
O	APPLE COMPUTER INC	19- 63	21 1/8	-1 3/8	-6.1
N	AT&T	60- 70	64 1/4	-1 1/4	-1.9
N	BURROUGHS CORP	28- 58	53 1/4	+ 5/8	+1.1
O	COMPUTER AUTOMATION	7- 17	7 5/8	- 3/8	-4.6
A	COMPUTER CONSOLES	8- 26	18 3/4	- 1/2	-2.5
N	CONTROL DATA CORP	21- 62	51 1/8	- 3/8	-0.7
O	CONVERGENT TECHNOL	19- 41	19 1/8	-3	-13.5
N	CRAY RESEARCH INC	20- 52	48 5/8	+4 1/8	+9.2
N	DATA GENERAL CORP	20- 82	74 7/8	- 1/8	-0.1
N	DATAPOINT CORP	11- 36	25 7/8	-1 1/8	-4.1
N	DIGITAL EQUIPMENT	62-132	100 3/4	-1 1/4	-1.2
A	EECO INC	6- 16	15 1/4	+ 1/2	+3.3
N	ELECTRONIC ASSOC.	5- 15	7 5/8	+ 3/8	+5.1
N	FLOATING POINT SYST	16- 44	36 3/8	+1 3/8	+3.9
N	FOXBORO	22- 47	37 1/2	+ 3/4	+2.0
O	GENERAL AUTOMATION	3- 16	11 3/8	+ 5/8	+5.8
N	GOULD INC	31- 44	33 3/8	+ 3/4	+2.2
N	HARRIS CORP	20- 51	37 7/8	+ 1/8	+0.3
N	HEWLETT-PACKARD CO	22- 48	41 3/4	- 1/4	-0.5
N	HONEYWELL INC	60-131	126 3/4	+1 1/4	+0.9
N	IBM	57-134	132 5/8	+1 1/2	+1.1
O	IPL SYSTEMS INC	5- 14	7 1/2	- 1/4	-3.2
N	LANIER BUSINESS PROD	12- 21	19 1/2	+ 1/4	+1.2
N	M/A-COM INC	22- 35	25	- 3/4	-2.9
O	MAGNUSON COMP SYSTS	2- 5	7/8	0	0.0
N	MANAGEMENT ASSIST	7- 18	12	+ 3/4	+6.6
N	MATSUSHITA ELEC(ADR)	47- 77	74 7/8	-2 1/2	-3.2
N	MODULAR COMPUTER SYS	6- 16	8 3/4	-1 5/8	-15.6
N	MOHAWK DATA SCI	10- 19	14 3/8	- 5/8	-4.1
N	MOTOROLA INC	82-148	141 3/8	-3 1/8	-2.1
N	NAT'L SEMICONDUCTOR	22- 60	55 1/2	+ 7/8	+1.6
N	NCR	39-135	132 1/2	+2 1/2	+1.9
N	PERKIN ELMER	17- 37	34 7/8	- 5/8	-1.7
N	PRIME COMPUTER INC	11- 30	16 3/4	- 1/8	-0.7
N	SPERRY CORP	21- 47	45	-1	-2.1
O	TANDEM COMPUTERS INC	14- 38	36 1/8	- 3/8	-1.0
N	TANDY CORP	37- 65	39 1/4	+ 1/8	+0.3
O	TELEVIDEO SYSTEMS	14- 41	14 1/8	-3 3/4	-20.9
N	TEXAS INSTRUMENTS	71-176	122 7/8	+6 7/8	+5.9
O	VECTOR GRAPHICS INC	3- 14	3 7/8	+ 3/4	+24.0
A	WANG LABS "B"	13- 42	38	+2 1/8	+5.9
A	WANG LABS "C"	11- 42	37	+1	+2.7
N	XEROX CORP	35- 50	48 1/8	+3	+6.6
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	11- 35	34	+2 1/4	+7.0
N	COMDISCO INC	7- 42	24 1/4	-14 3/8	-37.2
O	CONTINENTAL INFO SYS	3- 16	10 1/2	-1 3/4	-14.2
N	OPF INC	5- 15	13 3/4	- 7/8	-5.9
N	U.S. LEASING	18- 47	38 1/4	- 3/4	-1.9

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EXCH		PRICE 1982-83 RANGE (1)	CLOSE OCT 12 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	4	0	0.0
O	ADVANCED SYSTEMS INC	6- 22	17 3/4	+ 3/4	+4.4
O	AGS COMPUTERS INC	7- 32	24 5/8	+1 1/8	+4.7
O	AMERICAN SOFTWARE	21- 31	25	-2 3/4	-9.9
N	ANACOMP INC	9- 23	9	- 7/8	-8.8
O	ANALYSTS INTL CORP	5- 20	13 1/4	-2	-13.1
A	APPLIED DATA RES.	8- 37	32 3/4	+1 7/8	+6.0
O	ASK COMPUTER SYSTEMS	6- 21	19 1/2	- 1/4	-1.2
B	ASTRADYNE COMP IND	1- 7	3 7/8	- 1/4	-6.0
N	AUTOMATIC DATA PROC	21- 44	39	+1 5/8	+4.3
O	CGA COMPUTER ASSOC	5- 17	15 1/2	- 7/8	-5.3
O	COMPUTER ASSOC INT'L	6- 35	28 3/4	- 1/4	-0.8
O	COMPUTER HORIZONS	8- 20	13	+1	+8.3
O	COMPUTER NETWORK	4- 10	7	- 1/8	-1.7
N	COMPUTER SCIENCES	11- 23	18 1/8	+ 1/2	+2.8
O	COMPUTER TASK GROUP	6- 22	15 1/2	- 1/4	-1.5
O	COMPUTER USAGE	2- 22	13 1/2	-3 1/4	-19.4
O	COMPUTONE SYSTEMS	6- 38	6 1/2	-1	-13.3
O	COMSERV CORP	7- 20	8	- 1/4	-3.0
O	COMSHARE	7- 13	10 7/8	+ 1/8	+1.1
N	CULLINET SOFTWARE	12- 50	42 1/4	-2 1/4	-5.0
O	CYCARE SYSTEMS INC	9- 27	20 1/2	0	0.0
N	ELECTRONIC DATA SYST	10- 42	41	+1 1/2	+3.7
O	HOGAN SYSTEM INC	27- 53	42	-4 1/4	-9.1
N	GENERAL ELECTRIC CO	45- 58	53 1/4	-2 1/8	-3.8
N	GTE CORP	39- 48	44 1/2	- 3/4	-1.6
N	INFORMATICS INC	10- 34	26 1/4	+ 1/8	+0.4
O	INFOTRON SYSTEMS COR	25- 43	36 1/4	+2 1/2	+7.4
[illegible]	KEANE ASSOCIATES	4- 15	10	0	0.0
A	LOGICON	8- 30	29 1/2	+ 1/4	+0.8
O	MCI COMMUNICATIONS	13- 34	12 3/4	-2 7/8	-18.3
L	MGMT SCI AMER INC	8- 33	31 1/4	-1 1/4	-3.8
O	MATHEMATICAL APP GRP	12- 22	14 1/2	-1	-6.4
O	MICOM SYSTEMS INC	25- 50	47 1/4	+ 3/4	+1.6
O	MONCHIK WEBER CP	10- 22	9 3/4	-2 1/4	-18.7
O	NATIONAL DATA CORP	5- 26	16 7/8	+ 1/4	+1.5
O	ON-LINE SOFTWARE INT	19- 27	19 1/2	-1 1/2	-7.1
O	PANSOPHIC SYSTEMS	8- 30	24 1/2	+ 5/8	+2.6
N	PLANNING RESEARCH	6- 21	15 3/4	+ 1/4	+1.6
O	POLICY MGMT SYSTS CP	15- 35	29	- 3/4	-2.5
O	PROGRAMMING & SYS	1- 8	6 3/8	- 1/2	-7.2
O	REYNOLDS & REYNOLD	17- 53	45 3/4	+4	+9.5
O	SEI CORP	11- 34	31 1/2	0	0.0
O	SHARED MEDICAL SYST	13- 43	40 1/2	0	0.0
O	SCIENTIFIC COMPUTERS	6- 14	11 1/4	- 3/4	-6.2
O	SOFTWARE AG	5- 17	10	- 3/4	-6.9
N	TYMSHARE INC	12- 30	21 1/4	+2 1/4	+11.8
A	URS CORP	5- 18	13 1/8	- 5/8	-4.5
N	WYLY CORP	7- 17	12 1/4	- 5/8	-4.8
	COMPONENTS				
N	ADVANCED MICRO DEV	13- 35	21 1/4	+ 1/8	+0.4
O	ADV'D SEMICONDUCTOR	12- 34	33	+1 1/4	+3.9
N	ANALOG DEVICES INC	18- 42	41 1/4	+1 1/8	+2.8
O	ANALOGIC CORP	22- 27	22	-1	-4.3
N	APPLIED MAGNETICS CP	19- 37	30 1/2	+ 1/8	+0.4
N	TERADYNE	14- 39	37 1/4	+1	+2.7
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	4 1/4	+ 1/2	+13.3
A	ANDERSON JACOBSON	9- 26	11	- 7/8	-7.3
O	AUTO-TROL TECHNOLOGY	8- 29	22 1/2	- 1/2	-2.1
O	BANCTEC INC	7- 33	17	+2 1/4	+15.2
A	BEEHIVE INT'L	4- 15	8 1/2	-1	-10.5
A	BOLT.BERANEK & NEW	9- 60	53 1/4	-4	-6.9
O	CAMBEX CORP	2- 4	2 3/8	+ 1/8	+5.5
N	CENTRONICS DATA COMP	6- 28	22 1/8	-2 5/8	-10.6
A	CETEC CORP	4- 12	10 7/8	- 1/4	-2.2
O	COGNITRONICS	2- 20	9 1/2	+ 1/4	+2.7

EXCH		PRICE 1982-83 RANGE (1)	CLOSE OCT 12 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER DEVICES INC	3- 21	4 3/8	- 3/4	-14.6
O	COMPUTER TRANSCEIVER	4- 12	6 1/8	- 1/4	-3.9
N	COMPUTERVISION CORP	19- 53	42 3/8	- 1/8	-0.2
N	CONRAC CORP	17- 38	17 5/8	- 3/4	-4.0
A	DATAPRODUCTS CORP	16- 41	30 3/4	+ 1/4	+0.8
A	DATARAM CORP	5- 12	10 3/4	+ 1/8	+1.1
O	DATA SWITCH CORP	13- 41	32	- 1/2	-1.5
O	DATUM INC	2- 17	11 3/4	+ 1/4	+2.1
O	DECISION DATA COMPUT	3- 16	11 5/8	- 1/2	-4.1
O	DOCUTEL-OLIVETTI	13- 39	12 1/2	-5 1/2	-30.5
N	ELECTRONIC M & M	5- 11	7 7/8	- 1/8	-1.5
O	EVANS & SUTHERLAND	18- 50	41	- 1/4	-0.6
O	GANDALF TECHNOLOGIES	9- 22	9 3/8	+ 1/8	+1.3
N	GEN'L DATA COMM IND	6- 29	28 1/4	0	0.0
O	GREAT SOUTHWEST IND	2- 6	1 1/2	- 1/2	-25.0
N	HAZELTINE CORP	7- 31	23 5/8	- 3/4	-3.0
O	ICOT CORP	3- 10	4 1/4	+ 1/4	+6.2
O	INFORMATION INTL INC	10- 22	15	-1	-6.2
O	INTEL CORP	11- 45	41 3/4	+1 1/2	+3.7
O	IPL SYSTEMS INC	5- 14	7 1/2	- 1/4	-3.2
A	LUNDY ELECTRONICS	7- 19	13 5/8	0	0.0
O	MEGADATA CORP	9- 15	12 1/4	- 1/2	-3.9
A	MSI DATA CORP	16- 37	18	+1 3/8	+8.2
N	NASHUA CORP	9- 29	27 7/8	+ 3/8	+1.3
O	NETWORK SYSTEMS CORP	8- 34	22 5/8	+ 1/8	+0.5
N	NO AMERICAN PHILIPS	47- 73	72 1/2	+4 1/2	+6.6
N	NORTHERN TELECOM LTD	22- 49	43 3/8	-2 1/4	-4.9
O	OMEX	3- 6	6	0	0.0
N	PARADYNE CORP	14- 30	17	- 3/4	-4.2
A	PENRIL CORP	7- 14	10 1/2	- 1/8	-1.1
O	PHOENIX AMERICAN INC	7- 17	12 3/4	- 3/4	-5.5
N	PLESSEY CO (ADR)	26- 41	30 1/2	-2 3/4	-9.2
O	PRINTRONIX INC	23- 34	25	- 1/2	-1.9
O	RAMTEK CORP	12- 26	14 1/4	0	0.0
N	RAYTHEON CO	42- 58	46 7/8	- 1/4	-0.5
N	RECOGNITION EQUIP	4- 17	16	- 1/2	-3.0
N	ROLM CORP	40- 80	58	-4 1/2	-7.1
N	SANDERS ASSOCIATES	59-120	59 1/4	+1 3/8	+2.4
O	SCAN DATA	1- 3	7/8	- 1/4	-22.2
O	SCAN-TRON CORP	12- 16	13 1/4	0	0.0
N	SCIENTIFIC ATLANTA	15- 23	15 7/8	- 3/8	-2.3
N	STORAGE TECHNOLOGY	16- 33	19 1/4	0	0.0
O	SYKES DATATRONICS	6- 27	5 3/4	- 5/8	-9.8
O	SYSTEMS & COMP TECH	27- 39	30 1/4	-3 1/4	-9.7
A	T BAR INC	7- 17	10 3/8	+ 1/8	+1.2
A	TAB PRODUCTS CO	8- 30	23 1/4	- 3/4	-3.1
O	TANDON CORP	19- 35	24 1/4	-4 1/2	-15.6
A	TEC INC	6- 12	7 5/8	+ 1/4	+3.3
N	TEKTRONIX INC	34- 87	82 3/4	+1 3/4	+2.1
N	TELEX	5- 32	30 5/8	+2 5/8	+9.3
O	TESDATA SYSTEMS CP	3- 17	10 1/2	- 1/8	-1.1
N	TIMEPLEX INC	7- 29	22	- 5/8	-2.7
O	VISUAL TECHNOLOGY	9- 26	18	+1	+5.8
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 33	33 1/4	+ 3/4	+2.3
N	BARRY WRIGHT	13- 31	30	- 1/8	-0.4
A	DUPLEX PRODUCTS INC	12- 26	25 5/8	+ 1/2	+1.9
N	ENNIS BUS. FORMS	6- 25	24 3/4	+1 1/4	+5.3
N	3M COMPANY	49- 90	86 1/4	+ 3/4	+0.8
N	MOORE CORP LTD	26- 51	45 3/4	+ 1/2	+1.1
O	STANDARD REGISTER	11- 34	32 3/4	+ 3/4	+2.3
N	WALLACE BUS FORMS	11- 30	30	+3	+11.1

15 pointed questions to ask MSA or any software supplier

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who is worth his salt should be able to answer them without backpedaling.

Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is *the* software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

Our technical edge comes from experience

Staying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest $25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA relieves you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you.

And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That eliminates a lot of tedious work you normally have to do.)

Save this box. It can help you make an intelligent software decision.

1. Can you offer us a complete range of software systems designed to work together?
Or will we have to piece together a patchwork of systems?

2. Are your systems just record keepers, or can they really help us make decisions?
Can we pull together information from any of our integrated systems? In exactly the form we want it?

3. Can you provide business software for both mainframe and microcomputers?
Do you develop this software yourself or do you simply market it for another company?

4. Are your systems truly online so all of our information is current?
How many of your systems are online? How secure are they?

5. Will my company have to be the one that discovers the bugs in your brand new system?
Just how long have your systems actually been used, and how have they been tested?

6. Will you update your systems as technology advances and regulations change?
What are some of your most recent updates? Will you keep us current on regulatory changes?

7. Do your systems really do everything you say they will?
Or will we have to change them or add to them to get the features we want?

8. How long have you been in business?
What are your revenues? What is your growth record? Where will your company be five years from now?

9. How many systems has your company installed?
How many of these were installed in the past six months? How many of your earlier customers are still using —and liking—your systems?

10. Do your financial systems handle unlimited foreign currencies?
Do your financial systems use a common set of currency exchange rates?

11. Can you link our executives' computers directly to the mainframe—so they can get their own information?
Is that software available right now?

12. How will you make sure our own people thoroughly understand your system?
Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

13. How many of your people specialize in software for my industry?
How many accountants work for you? Human resource specialists? Manufacturing experts?

14. Do your systems have built-in features that make them easier to use?
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

15. As my business changes will your system be flexible enough to change with it?
Or will we have to pay a lot to revamp it? Or even regenerate it?

35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

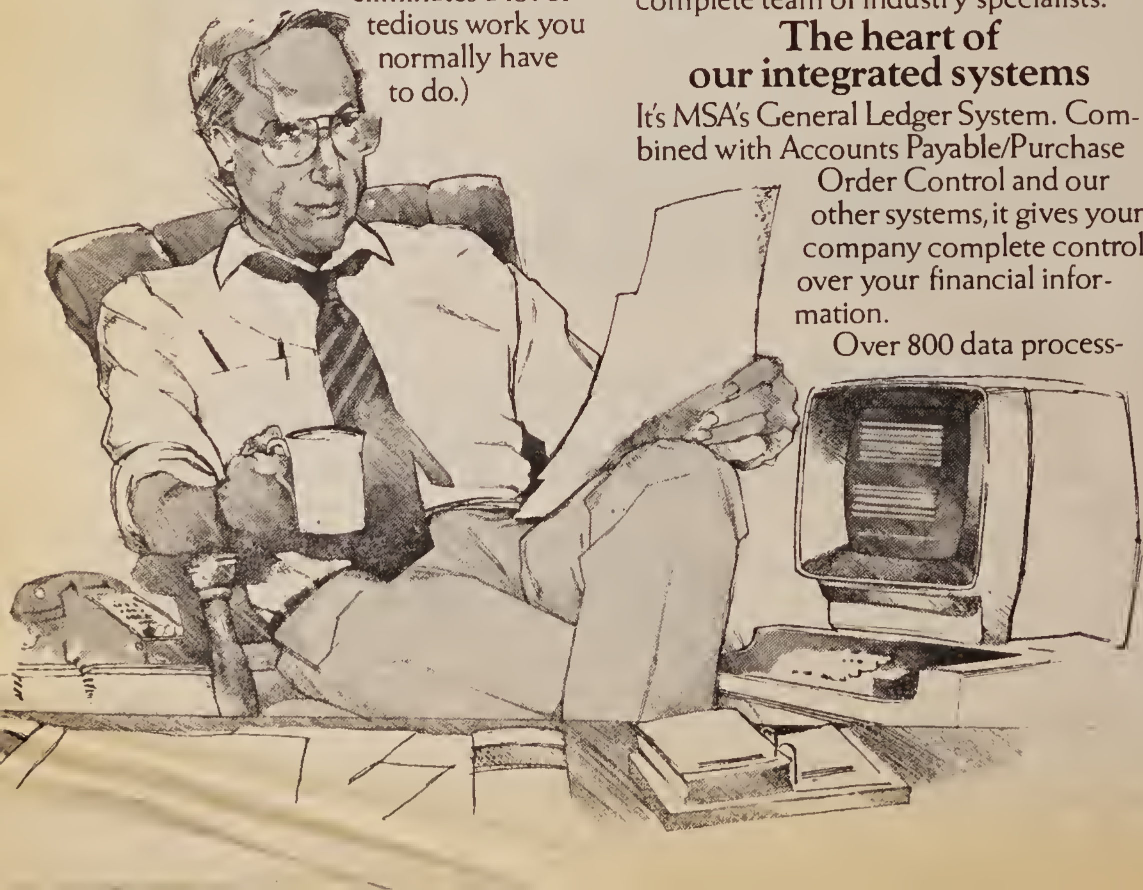
And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASY-SCREEN™ lets them design their own screens without creating data processing nightmares.

If there's ever a question or problem with our systems, MSA customers are always close to service.

Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

The heart of our integrated systems

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.



Over 800 data processing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll tie your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with MSA's Executive Peachpak™ application software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

MSA ready-to-install application software
1. General Ledger
2. Accounts Payable/Purchase Order Control
3. Budgetary Control/Encumbrance
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5. Capital Expenditure Tracking
6. Forecasting & Modeling
7. Accounts Receivable
8. Order Processing
9. Foreign Exchange
10. Inventory & Purchasing
11. Payroll
12. Personnel Management & Reporting
13. ALLTAX™ Taxing System
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16. Executive Peachpak™
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18. Peachtree Software™ office productivity systems for microcomputers

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